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=> d que 147  
L40 52716 SEA FILE=WPIX ABB=ON ?LIGNIN? OR ?LIGNO? OR CONFERYL ALC? OR  
SYRINGENIN?  
L41 1596 SEA FILE=WPIX ABB=ON L40 AND (POLYACRYL OR POLYVINYL? OR  
?GLYCOL?)  
L42 4776 SEA FILE=WPIX ABB=ON L40 AND ?POLYMER?  
L43 110 SEA FILE=WPIX ABB=ON (L41 OR L42) AND ELECTROLYT?  
L44 25 SEA FILE=WPIX ABB=ON L43 AND BATTER?  
L45 8 SEA FILE=WPIX ABB=ON L44 AND (FINE OR ULTRAFINE OR PARTIC?)  
L46 18 SEA FILE=WPIX ABB=ON L44 AND H01M?/IC  
L47 19 SEA FILE=WPIX ABB=ON L45 OR L46

=> d 147 full 1-19

L47 ANSWER 1 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
AN 2006-051185 [06] WPIX  
DNN N2006-044032 DNC C2006-019584  
TI Lead storage **battery** has a container with gap connected to an  
**electrolyte** liquid, and filled with organic **polymer**  
which dissolves in **electrolyte** liquid, and raises hydrogen over  
voltage of cathode at time of charging.

DC A85 L03 X16  
IN KOZAWA, S; OKAYASU, T; YOSHIO, M  
PA (KOZA-I) KOZAWA S; (MASE-I) MASE S; (OKAY-I) OKAYASU T  
CYC 1  
PI JP 2005353559 A 20051222 (200606)\* 6 H01M010-12 <--

ADT JP 2005353559 A JP 2004-202491 20040611

PRAI JP 2004-202491 20040611

IC ICM H01M010-12

ICS H01M004-14; H01M004-62; H01M010-08

AB JP2005353559 A UPAB: 20060124

NOVELTY - The lead storage **battery** (3) has a container with gap connected to **electrolyte** liquid, and filled with organic **polymer** which dissolves in the **electrolyte** liquid, and raises hydrogen over voltage of cathode (4) at the time of charging.

The **electrolyte** liquid is **electrolyte** liquid containing dilute sulfuric acid as main component or **electrolyte** liquid containing organic **polymer** (0.01-0.2 weight%) having sulfuric acid as main component.

USE - As lead storage **battery**.

ADVANTAGE - The lead storage **battery** has favorable cathode active material activity for long period of time, and maintains concentration of organic **polymer** in **electrolyte** liquid at required value.

DESCRIPTION OF DRAWING(S) - The figure shows the sectional drawing of the lead storage **battery**.

cloth bag woven from glass fiber 1

organic **polymer** 2

lead storage **battery** 3

cathode 4

separator 5

Dwg.1/3

TECH JP 2005353559 AUPTX: 20060124

TECHNOLOGY FOCUS - **POLYMERS** - Preferred Composition: The gap connected to the **electrolyte** liquid comprises glass fiber, polyethylene resin, polypropylene resin and/or fluoro resin.

Preferred **Polymer**: The organic **polymer** is **polyvinyl** alcohol, polyacrylic acid and/or lignin.

FS CPI EPI

FA AB; GI

MC CPI: A12-E06; L03-E01B1; L03-E01C4

EPI: X16-B01B; X16-J02; X16-J07

L47 ANSWER 2 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2005-477563 [48] WPIX

DNN N2005-388739 DNC C2005-145495

TI Production of coated silicon/carbon **particles** used as electrode active material in electrical storage cell, by coating **particles** of carbonaceous material with carbon residue forming material, and subjecting to oxidation reaction.

DC A85 L03 P42 P56 X16

IN CHAHAR, B; MAO, Z

PA (CHAH-I) CHAHAR B; (MAOZ-I) MAO Z; (CONO) CONOCOPHILLIPS CO

CYC 108

PI US 2005136330 A1 20050623 (200548)\* 15 H01M004-58 &lt;--

WO 2005065082 A2 20050721 (200551) EN C01B000-00

RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IS IT  
KE LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM  
ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE  
DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG  
KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ  
OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG  
US UZ VC VN YU ZA ZM ZW

ADT US 2005136330 A1 US 2003-741381 20031219; WO 2005065082 A2 WO 2004-US38115  
20041115

PRAI US 2003-741381 20031219

IC ICM C01B000-00; H01M004-58

ICS B05D007-00; B23P019-00; H01M002-00; H01M002-26;

H01M002-28; H01M006-00

AB US2005136330 A UPAB: 20050728

NOVELTY - Production of coated silicon/carbon **particles**, comprises coating silicon **particles** with carbon residue forming material; coating **particles** of carbonaceous material with carbon residue forming material; embedding coated silicon **particles** onto formed coated carbonaceous **particles**; coating formed silicon/carbon composite **particles** with carbon residue forming material; and stabilizing **particles** by subjecting to oxidation reaction.

DETAILED DESCRIPTION - Production of coated silicon/carbon **particles**, comprises:

- (1) providing a carbon residue forming material;
- (2) providing silicon **particles**;
- (3) coating the silicon **particles** with the carbon residue forming material to form coated silicon **particles**;
- (4) providing **particles** of a carbonaceous material;
- (5) coating the **particles** of carbonaceous material with the carbon residue forming material to form coated carbonaceous **particles**;
- (6) embedding the coated silicon **particles** onto the coated carbonaceous **particles** to form silicon/carbon composite **particles**;
- (7) coating the silicon/carbon composite **particles** with the carbon residue forming material to form coated silicon/carbon composite **particles**; and
- (8) stabilizing the coated composite **particles** by subjecting the coated composite **particles** to an oxidation reaction.

INDEPENDENT CLAIMS are also included for the following:

- (A) coated silicon/carbon composite **particles**, comprising a core of coated silicon and coated carbonaceous **particle** that is further coated with a layer of carbon residue forming material;
- (B) a method for the production of a lithium (Li)-ion **battery** where the coated carbonaceous **particles** are used as the anode material, and such Li-ion **battery** exhibits a first cycle charge efficiency greater than 90% at the cut-off potential of 1 volt versus Li when tested with **electrolyte** containing no propylene carbonate solvent;
- (C) an electrical storage cell comprising the coated carbonaceous **particles**;
- (D) a method for the manufacture of an electrical storage cell which comprises incorporating the coated composite **particles** into an anode of the electrical storage cell;
- (E) an anode of an electrical storage cell comprising the coated **particles**.

USE - For production of coated silicon/carbon **particles** for use as electrode active material in electrical storage cell that is a rechargeable electrical storage cell used as **battery** (claimed).

ADVANTAGE - The method provides high capacity and high efficiency carbon-coated silicon/carbon composite **particles** with smooth coatings. The **particles** have good powder flowability, which is particularly beneficial during the handling or manufacturing steps necessary to form these materials into useful electrodes.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic view of a composite carbon-silicon **particle**.

Dwg.1/5

TECH US 2005136330 A1UPTX: 20050728

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Process: The carbon residue forming material is provided in a solution comprising one or more solvents and the carbon residue forming material. The silicon **particles** and **particles** of a carbonaceous material are supplied as a suspension in a solution comprising one or more solvents before mixing with solution of carbon residue forming material. The process further comprises adding one or more solvents to the mixture of the solution of carbon residue forming material and the **particles**; stabilizing the silicon **particles** after coating; or carbonizing the silicon **particles**. The **particles** are carbonized in an inert atmosphere at 400-1500degreesC. The solution of carbon residue forming material is mixed at an elevated temperature to dissolve the carbon residue forming material in one or more solvents. The oxidation reaction is carried out in the presence of an oxidizing agent. Preferred Material: The solvent is toluene, benzene, xylene, quinoline, tetrahydrofuran, tetrahydronaphthalene, naphthalene, methanol, acetone, methyl-pyrrolidinone, cyclohexane, ether or water.

Preferred Component: The carbonaceous **particles** comprise a pulvurant carbonaceous material from petroleum pitches, calcined petroleum cokes, uncalcined petroleum cokes, highly crystalline cokes, coal tar cokes, synthetic graphites, natural graphites, soft carbons derived from organic **polymers**, or soft carbons derived from natural **polymers**.

Preferred Composition: The ratio of the one or more solvents to the carbon residue forming material in the mixture of the carbon residue forming material solution and the **particle** suspension is greater than or equal to 2:1 (preferably greater than or equal to 4:1).

TECHNOLOGY FOCUS - **POLYMERS** - Preferred Material: The carbon residue forming material is a **polymeric** material from heavy aromatic residues from petroleum and coal of chemical processes, **lignin** from pulp industry, phenolic resins, or carbohydrate materials.

FS CPI EPI GMPI

FA AB; GI

MC CPI: A12-E06A; L03-E01B8

EPI: X16-B01; X16-E01C

L47 ANSWER 3 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
AN 2005-338175 [35] WPIX

DNN N2005-276655 DNC C2005-105339

TI Charging method of lead storage **battery** used for motor vehicles, involves applying pulse current to **battery** having **electrolyte** liquid containing polyacrylic acid, **polyvinyl** alcohol and/or **lignin** granule.

DC A85 L03 X16

PA (MAZE-I) MAZE S; (OZAWA-I) OZAWA A

CYC 1

PI JP 2005116493 A 20050428 (200535)\* 6 H01M010-44 &lt;--

ADT JP 2005116493 A JP 2003-383150 20031008

PRAI JP 2003-383150 20031008

IC ICM H01M010-44

ICS H01M010-08

AB JP2005116493 A UPAB: 20050603

NOVELTY - A pulse current is applied to lead storage **battery** having **electrolyte** liquid containing polyacrylic acid, **polyvinyl** alcohol and/or **lignin** granule, and **battery** is charged.

USE - For charging lead storage **battery** used for motor

vehicles.

**ADVANTAGE** - The lead storage **battery** containing organic **polymer** in the **electrolyte** liquid has favorable charging and discharging cycle characteristics and recovers **battery** characteristics rapidly by using charging current containing pulse. The **battery** characteristics are stably maintained for long period of time using inexpensive direct current power source for 1 year or more without changing the charger. The organic **polymer** prevents crystal growth of lead sulfate and therefore maintains the characteristics for long period of time even if the once recovered **battery** characteristics does not use pulse current for subsequent charging.

**DESCRIPTION OF DRAWING(S)** - The figure shows an example of the pulse wave used for charging lead storage **battery**. (Drawing includes non-English language text).

Dwg.1/4

FS CPI EPI  
 FA AB; GI  
 MC CPI: A03-A00A; A04-F04A; A10-E09B2; A12-E06; A12-E09; A12-T04C; L03-E01C1;  
 L03-E03; L03-H05  
 EPI: X16-B01B; X16-G01

L47 ANSWER 4 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2005-331053 [34] WPIX  
 DNN N2005-270796 DNC C2005-102911  
 TI Preparation of thin film **battery** useful for integrated devices, involves vapor depositing cathode, **electrolyte**, and anode layers through flexible, repositionable, **polymeric** shadow mask.  
 DC A32 A85 L03 P42 X16 X25  
 IN BAUDE, P F; HAASE, M A; KELLEY, T W; MUYRES, D V; THEISS, S D  
 PA (MINN) 3M INNOVATIVE PROPERTIES CO  
 CYC 108  
 PI US 2005079418 A1 20050414 (200534)\* 19 H01M006-00 <--  
 WO 2005041324 A2 20050506 (200534) EN H01M000-00 <--  
 RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE  
 LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW  
 W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE  
 DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG  
 KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ  
 OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG  
 US UZ VC VN YU ZA ZM ZW

ADT US 2005079418 A1 US 2003-685725 20031014; WO 2005041324 A2 WO 2004-US27932  
 20040827

PRAI US 2003-685725 20031014

IC ICM H01M000-00; H01M006-00

ICS B05D005-12; C23C016-26; H01M004-58

AB US2005079418 A UPAB: 20050527

NOVELTY - Thin film **battery** is prepared by:

(A) providing a substrate;  
 (B) optionally depositing a cathode current collector;  
 (C) depositing a cathode layer, an **electrolyte** layer, and an anode layer; and  
 (D) optionally depositing an anode current collector layer and an encapsulant layer.

The layer(s) is vapor deposited through a flexible, repositionable, **polymeric** shadow mask.

**DETAILED DESCRIPTION** - INDEPENDENT CLAIMS are also included for:

(1) thin film **battery** prepared by the above method; and  
 (2) mask set for producing a thin film **battery** comprising a first aperture mask (10A) formed with three patterns (12A) of deposition apertures that define respective part of anode, cathode and

electrolyte layers.

USE - For preparing thin film **battery** useful for integrated circuit (claimed) and electronic devices.

ADVANTAGE - The inventive method is capable of producing thin film **battery** with reduce human error and increase throughput. The **battery** is produced solely using aperture mask deposition and without requiring ant etching or photolithography steps, which are used to form thin film **battery** patterns.

DESCRIPTION OF DRAWING(S) - The figure is a perspective view of an aperture mask wound into a roll.

Aperture mask 10A

Wind flexible film 11A

Patterns 12A

Roll of film 15A

Dwg.1/11

TECH US 2005079418 A1UPTX: 20050527

TECHNOLOGY FOCUS - CERAMICS AND GLASS - Preferred Material: The substrate layer can be glass substrate or silica substrate.

TECHNOLOGY FOCUS - ELECTRONICS - Preferred Material: The substrate layer can be integrated circuit.

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Method: The cathode and anode current collectors are deposited concurrently. The vapor-depositing step includes positioning the aperture mask proximate to the substrate. Each deposition step involves vapor deposition. The method includes the steps of aligning the substrate with the current collector mask, vapor depositing a current collector layer onto the substrate, aligning the substrate with an **electrolyte** mask, depositing the **electrolyte** layer, aligning the substrate with an anode mask, depositing the anode layer, and optionally depositing the encapsulant layer, in which this steps are repeated until desired number of **battery** cells has been deposited to produce a multicell **battery**. The cells are connected in series and/or parallel to produce a planar array or stacked column of thin film **batteries** on the substrate. The vapor depositing steps are sputtering, thermal evaporation, electron beam evaporation, chemical vapor depositing, metal organic chemical vapor depositing, combustion chemical vapor depositing and plasma enhanced chemical vapor, or pulsed laser deposition steps. The aperture mask is formed with a number of deposition mask patterns, which are formed with greater than or equal to 2 different mask patterns. It is flexible so that it can be wound to form a roll.

Preferred Component: The substrate layer is **battery**. The aperture mask comprises an elongated web of flexible film where a deposition mask pattern is formed. The deposition mask pattern defines deposition apertures that extend through the film that define a portion of the **battery** cell. The current collector layer of the **battery** is shared with the source, drain, or gate electrode of the integrated circuit.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Material: The substrate layer can be silicon substrate. The cathode is a lithium transition metal oxide, preferably amorphous vanadium oxide (V2O5), crystalline titanium sulfide (TiS2), lithium manganese oxide-containing compound (LiMn2O2, LiMnO2, LiMnO4, or Li<sub>x</sub>Mn<sub>2-y</sub>O<sub>4</sub>), lithium cobalt and nickel oxide-containing compound (LiCo<sub>0.2</sub>Ni<sub>0.8</sub>O<sub>2</sub>), lithium cobalt oxide-containing compound (LiCoO<sub>2</sub>), lithium vanadium oxide-containing compound (LiV<sub>3</sub>O<sub>8</sub> or LiV<sub>2</sub>O<sub>5</sub>, or LiV<sub>3</sub>O<sub>13</sub>), or V<sub>2</sub>O<sub>5</sub>. The **electrolyte** is lithium phosphorus oxynitride. The anode layer is lithium metal, lithium intercalation compounds, silicon-tin oxynitride, tin, or gold.

TECHNOLOGY FOCUS - MECHANICAL ENGINEERING - Preferred Component: A drive mechanism is provided to move first and/or second webs relative to the other web. A deposition unit is provided to deposits onto the substrate through the deposition mask pattern defined by the **polymeric** aperture mask. An alignment mechanism aligns the deposition mask pattern of the **polymeric** aperture mask with the substrate prior to deposition. It is a stretching apparatus for stretching the **polymeric** aperture mask or substrate film to align the deposition mask pattern relative to the substrate or to the **polymeric** aperture mask, respectively.

TECHNOLOGY FOCUS - METALLURGY - Preferred Material: The anode layer can be tin/lead alloys.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Material: The substrate layer can be silicon substrate. The cathode is a lithium transition metal oxide, preferably amorphous vanadium oxide (V2O5), crystalline titanium sulfide (TiS2), lithium manganese oxide-containing compound (LiMn2O2, LiMnO2, LiMnO4, or Li<sub>x</sub>Mn<sub>2-y</sub>O<sub>4</sub>), lithium cobalt and nickel oxide-containing compound (LiCo<sub>0.2</sub>Ni<sub>0.8</sub>O<sub>2</sub>), lithium cobalt oxide-containing compound (LiCoO<sub>2</sub>), lithium vanadium oxide-containing compound (LiV<sub>3</sub>O<sub>8</sub> or LiV<sub>2</sub>O<sub>5</sub>, or LiV<sub>3</sub>O<sub>13</sub>), or V2O5. The **electrolyte** is lithium phosphorus oxynitride. The anode layer is lithium metal, lithium intercalation compounds, silicon-tin oxynitride, tin, or gold.

TECHNOLOGY FOCUS - POLYMERS - Preferred Material: The substrate layer can be rigid orflexible **polymeric** substrate. The **polymeric** aperture mask comprises polyimide, polyester, polystyrene, polymethyl methacrylate, or polycarbonate **polymers**. The aperture mask comprises an elongated web of flexible film. the film is sufficiently flexible to be wound into a roll.

TECHNOLOGY FOCUS - TEXTILES AND PAPER - Preferred Material: The substrate layer can be paper substrate, woven substrate, or nonwoven substrate.

FS CPI EPI GMPI

FA AB; GI

MC CPI: A11-C04B; A12-E06; A12-E07C; L03-E01

EPI: X16-A; X16-E01C; X16-E02; X25-A04

L47 ANSWER 5 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2004-782618 [77] WPIX

CR 2003-027874 [02]; 2003-731370 [69]; 2003-801676 [75]; 2004-387456 [36]

DNN N2004-616634 DNC C2004-273911

TI Composition useful in e.g. carrier media such as circuit boards comprises powder having specific average **particle** sizes; coating imparted to the powder **particles**; and carrier medium.

DC A18 A28 A85 G04 L03 U11 V04 X12 X16

IN GURIN, M H

PA (GURI-I) GURIN M H

CYC 1

PI US 2004206941 A1 20041021 (200477)\* 15 H01B001-00

ADT US 2004206941 A1 CIP of US 2000-721074 20001122, CIP of WO 2001-US49758 20011220, Provisional US 2002-391601P 20020627, US 2003-603332 20030626

FDT US 2004206941 A1 CIP of US 6432320

PRAI US 2002-391601P 20020627; US 2000-721074 20001122; WO 2001-US49758 20011220; US 2003-603332 20030626

IC ICM H01B001-00

AB US2004206941 A UPAB: 20041203

NOVELTY - A composition comprises powder having average **particle** sizes of nanometer - micron; coating imparted to the powder

**particles; and carrier medium selected from carrier fluids, monomers, interpolymers, polymers, and phase change materials.**

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:

(1) method (m1) transferring heat between a heat source and a heat sink involving interposing between the heat source and the heat sink a heat transfer composition comprising a surface-coated powder (P1), where the coating imparting improves thermal conductivity properties to (P1) relative to uncoated powder;

(2) method (m2) of transferring electrons between cathode, an electron source, anode and an electron sink involving interposing between the cathode and anode an electrically conductive composition comprising a surface-coated powder (P2), the coating imparting improves electrical conductivity properties to (P2) relative to uncoated powder;

(3) a powder having enhanced thermal and electrical conductivity comprising powder precursor having average **particle** sizes of nanometer - micron size produced by a process step selected from solubilized, dispersed, emulsified, grinded, spray atomized and vaporized; coating imparted to the powder precursor **particles**; and reaction medium selected from solvents, fluids, monomers, **interpolymers**, **polymers**, and phase change materials;

(4) in situ complexing of coating compound on powder precursor **particles** is prepared by one of: microemulsions and chemical reduction of pre-complexed metal salts; microemulsions and reduction of pre-complexed metal salts using sonochemistry; sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation in reaction vessel for reduction of pre-complexed metal salts; sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating by electroless deposition of pre-complexed metal salts; sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating deposition by electrolysis of pre-complexed metal salts; sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating deposition by electrolysis of pre-complexed metal salts using high frequency electrical power source; submicron atomization of pre-complexed metal salts in liquid carrier with in situ chemical reduction; submicron atomization of pre-complexed metal salts in liquid carrier with in situ electrochemical reduction; submicron atomization of pre-complexed metal salts in liquid carrier within vessel with voltage potential between atomizer and cathode; plasma processing of powder precursor with quenching in liquid carrier having pre-solubilized complexing coating compound; combustion synthesis processing of powder precursor with quenching in liquid carrier having pre-solubilized complexing coating compound; pre-complexed powder precursor dissolved in supercritical fluid with in situ chemical reduction; pre-complexed powder precursor dissolved in supercritical fluid with in situ electrochemical reduction; electrolysis of pre-complexed metal salts using high frequency electrical power source on anode and cathode; electrolysis of pre-complexed metal salts using electrically conductive material selected from group of **electrolyte** or conductive **polymer**; high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound; high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound in combination with high or ultrahigh frequency acoustic wave generation of cavitation in reaction vessel; high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound in combination with high or ultrahigh frequency electromagnetic force generation in reaction vessel; cryogenic embrittlement in combination with processes selected from high pressure

hydrogen embrittlement, or high/ultrahigh frequency acoustic wave generation of cavitation in reaction vessel; or electrodialysis of pre-complexed metal salts in combination with processes selected from the group of high pressure hydrogen embrittlement, or high/ultrahigh frequency acoustic wave generation of cavitation on cathode.

USE - For enhancing the thermal conductivity, coefficient of thermal heat transfer, electrical conductivity in a carrier media e.g. circuit boards, conductive inks, electromagnetic and radio frequency protective coatings, fuel cells, **battery** systems and paints; and in heat transfer media e.g. engine cooling, heating, air conditioning, refrigeration, thermal storage, in heat pipes, fuel cells, **battery** systems, hot water, steam systems, and microprocessor cooling systems.

ADVANTAGE - The composition has enhanced thermal and electrical conductivity, and energy efficiency of host carrier. The coating provides stabilization, corrosion resistance and dispersant. Resources are reduced by utilizing standard plastic and sintering production processes. Coated compound is readily dispersed in the carrier medium. Stabilization and passivation of the coated compound enables direct immersion into corrosive environments. The coated compound maintains a mobile colloidal dispersion within the phase change material, enabling the coated compound to be utilized without the use of dispersion enhancement devices in a host carrier system.

Dwg.0/0

TECH US 2004206941 A1UPTX: 20041203

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Components: The coating further comprises an inorganic corrosion inhibitor compound. The powder is a carbon powder. The coating is selected from alkali metal salts, alkali earth metal salts, ammonium salts, and alkyl ether phosphates.

TECHNOLOGY FOCUS - METALLURGY - Preferred Components: The powder is selected from metal, metal alloy, organic metal compounds, inorganic metal compounds and/or carbon (preferably metals selected from copper, titanium, nickel, beryllium, iron, silver, gold, their alloys, blends, and compounds; carbons selected from graphite, carbon nanotubes, diamond, fullerene carbons of the general formula  $(C_2)_n$ , and their blends). The powder selected from aluminum and aluminum alloys. The coating further comprises a cerium compound. The powder is selected from copper, silver, iron, steel and their alloys.

$n =$  at least 30.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Components: The coating further comprises a coating acting as at least one of imparting composition stabilization, corrosion resistance and acting as a dispersant. The coating acts as dispersant of the powder in the carrier medium by at least one of increasing settling time of the powder, passivating the powder, reducing interfacial tension of the powder and increases adhesion to the powder. The powder further comprises an average particle size of less than 10 microns (preferably 10 nm - 2  $\mu$ m).

The carrier medium is selected from solids, fluids, phase change materials and **interpolymer**. The carrier medium further comprises a phase change medium selected from salt-hydrates, organic eutectics, clathrate-hydrates, paraffins, hydrocarbons, Fischer-Tropsch hard waxes, inorganic eutectic mixtures, acetamide, methyl fumarate, myristic acid, Glauber's salt, paraffin wax, fatty acids, methyl-esters, methyl palmitate, methyl stearate, mixtures of short-chain acids, capric and lauric acid, coconut fatty acids, propane and methane. The coating is selected from azoles, benzotriazole, tolytriazole, halogen resistant azoles, and their substituted derivatives. The powder is a carbon powder and the coating further comprises a lignin-based compound, ethylene oxide/propylene oxide (EO/PO) block **copolymers**, anionic surfactants, ionic surfactants and nonionic surfactants. The coating is

selected from mercapto-substituted thiadiazoles, amino-substituted thiadiazoles, and mercapto-substituted triazole, amino-substituted triazoles, oleyl imidazoline, triethanolamine and monoethanolamine. The lignin-based compound further comprises at least one of a monovalent salt of lignin, free acid lignin, polyvalent metal salts of lignin, lignin sulfonic acid, alkali metal salts of lignin sulfonic acid, alkaline earth metal salts of lignin sulfonic acid, and ammonium salts of lignin sulfonic acid. Preferred Method: (m1) Involves suspending the coated powder in a heat transfer medium. The surface-coated powder is prepared by complexing a coating compound with powder particles; adsorbing a coating compound on surfaces of the powder particles; or imparting a metal coating onto surfaces of powder particles and subsequently complexing the metal coating with another coating. The coating compound forms at least a molecular monolayer of the coating compound on surfaces of the powder particles. (m2) involves suspending the coated powder in an electrically conductive medium.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Components: The coating further comprises an inorganic corrosion inhibitor compound. The powder is a carbon powder. The coating is selected from alkali metal salts, alkali earth metal salts, ammonium salts, and alkyl ether phosphates.

TECHNOLOGY FOCUS - POLYMERS - Preferred Components: The interpolymer is prepared by polymerizing alpha-olefin monomer with vinylidene aromatic monomer and aliphatic vinylidene monomers with a volume ratio of 10:1 - 1:100 and a weight percent of 99 - 1% (preferably prepared with polymerizable ethylenically unsaturated monomer). The carrier medium is selected from 98 compounds given in specification e.g. conjugated polymers.

ABEX US 2004206941 A1UPTX: 20041203

SPECIFIC COMPOUNDS - TRY - Preferred Components: The coating further comprises a coating acting as at least one of imp

EXAMPLE - A solution of COBRATEC TT 100 (RTM; tolyltriazole) was dissolved in a volatile organic solvent comprising 2-butanone and stirred on a magnetic stirring hot plate. Cu 110 (RTM; copper powder) (3 weight%) was reduced to a powder of an average particle size of 50 nanometers. The resulting copper powder was slurried in the solution for about 15 minutes at 50 - 55degreesC. The coated product was isolated by filtration, washed once with solvent and then dried in air or by oven drying. The product showed enhanced thermal transfer properties and dispersion characteristics when combined with heat transfer media as compared with an untreated copper powder.

FS CPI EPI

FA AB

MC CPI: A08-M; A12-E01; A12-W11G; G04-B01; L03-A01A3; L03-A02; L03-H04E4

EPI: U11-D02B; V04-R02P; V04-T03A; V04-T03H; V04-T03P; V04-U01; X12-D01; X12-D01X; X16-C

L47 ANSWER 6 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2004-237892 [22] WPIX

CR 2004-097627 [10]

DNN N2004-188621 DNC C2004-092968

TI Electrochemical lead-acid battery comprises electrolyte having organic polymer, and ultra fine lignin having specified particle size.

DC A85 L03 X16

IN HRADA, H; KOZAWA, A; YOKOI, G

PA (HRAD-I) HRADA H; (KOZA-I) KOZAWA A; (YOKO-I) YOKOI G

*applicants*

CYC 108  
 PI US 2004033422 A1 20040219 (200422)\* 10 H01M010-08 <--  
 WO 2004105161 A2 20041202 (200479) EN H01M002-16 <--  
 RW: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE  
 LS LU MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW  
 W: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE  
 DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG  
 KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ  
 OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG  
 US UZ VC VN YU ZA ZM ZW  
 JP 2004356076 A 20041216 (200482) 4 H01M010-42 <--  
 JP 2004356077 A 20041216 (200482) 3 H01M010-54 <--  
 ADT US 2004033422 A1 CIP of US 2003-439258 20030515, US 2003-634592 20030805;  
 WO 2004105161 A2 WO 2004-IB1727 20040526; JP 2004356076 A JP 2003-185790  
 20030526; JP 2004356077 A JP 2003-185791 20030526  
 PRAI JP 2003-185791 20030526; JP 2002-141177 20020516;  
 JP 2003-185790 20030526  
 IC ICM H01M002-16; H01M010-08; H01M010-42;  
 H01M010-54  
 ICS C25C001-22; H01M010-44  
 AB US2004033422 A UPAB: 20041223  
 NOVELTY - An electrochemical lead-acid **battery** comprises  
**electrolyte** having **organic polymer**, and **ultra**  
**fine lignin** having **particle** size between  
 0.01-0.8 micron.  
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a  
 process of charging a lead-acid **battery** comprising adding to the  
**electrolyte** of the **battery** an **organic polymer**  
 (s), and discharging the **battery** at a high current rate of at  
 least 0.3C for at least 5 minutes.  
 USE - For use as electrochemical lead-acid **battery**.  
 ADVANTAGE - The invention has long life, and can be recharged to  
 enhance its new power properties.  
 Dwg.0/4  
 TECH US 2004033422 A1UPTX: 20040331  
 TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Component: The  
**electrolyte** contains additional additive from silicone compounds,  
 indium, tin, lead sulfate, and/or barium sulfate. It further includes  
 antimony as impurity.  
 Preferred Property: The **ultra fine lignin** has a  
**particle** size between 0.1-0.6 micron.  
 TECHNOLOGY FOCUS - POLYMERS - Preferred Component: The **organic polymer** is from polyacrylic acid or its **copolymers**,  
**polyvinyl alcohol**, or **ethylene glycol**.  
 Preferred Composition: The **polymer** is present in aqueous  
 solution at 0.1-13% in water. The additional additive is present between  
 0.01-0.1%/**12-volt 50-ampere battery**.  
 FS CPI EPI  
 FA AB  
 MC CPI: A03-C02; A12-E06; A12-M; L03-E01B1; L03-E01C1  
 EPI: X16-B01B  
 L47 ANSWER 7 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2004-097627 [10] WPIX  
 CR 2004-237892 [22]  
 DNN N2004-077753 DNC C2004-040513  
 TI Electrochemical lead acid **battery** for vehicles comprises  
**electrolyte** containing **organic polymer** and  
**ultrafine lignin** having **preset particle** size.

DC A85 L03 X16  
 IN HARADA, H; KOZAWA, A; YOKOL, G  
 PA (OZAW-I) OZAWA A; (TAKE-N) TAKEHARA KK; (YOKO-N) YOKOI KAIHATSU KK;  
 (HARA-I) HARADA H; (KOZA-I) KOZAWA A; (YOKO-I) YOKOL G  
 CYC 2  
 PI US 2003228525 A1 20031211 (200410)\* 10 H01M010-08 <--  
 JP 2003331908 A 20031121 (200410) 3 H01M010-08 <--  
 ADT US 2003228525 A1 US 2003-439258 20030515; JP 2003331908 A JP 2002-141177  
 20020516  
 PRAI JP 2002-141177 20020516  
 IC ICM H01M010-08  
 ICS H01M010-44  
 AB US2003228525 A UPAB: 20040331  
 NOVELTY - The electrochemical lead acid **battery** comprises an  
 electrolyte containing an organic **polymer** and an  
**ultrafine lignin** having a **particle** size of  
 0.01-0.8 **mu m**.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for process  
 of charging lead acid **battery** containing **electrolyte**  
 and active components.

USE - For vehicles e.g. cars, trucks, buses, forklifts and golf  
 carts, solar power generated electricity storage and hybrid cars.

ADVANTAGE - The electrochemical lead acid **battery** has  
 excellent durability, high rate charging-discharging property, high rate  
 discharge current and increased operation time. The **battery** has  
 favorable activation effect due to the presence of **ultrafine**  
**lignin particles**.

DESCRIPTION OF DRAWING(S) - The figure shows the plot of a curve of  
 the specific gravity of the **electrolyte** of a **battery**  
 and its voltage.

Dwg.1/4

TECH US 2003228525 A1UPTX: 20040210

TECHNOLOGY FOCUS - **POLYMERS** - Preferred **Polymers**: The  
 organic **polymers** are polyacrylic acid or its **copolymers**  
 , **polyvinyl alcohol** and/or **ethylene glycol**.

FS CPI EPI  
 FA AB; GI  
 MC CPI: A12-E06; A12-E09; L03-E01B1; L03-E01C4  
 EPI: X16-B01B; X16-G; X16-J02

L47 ANSWER 8 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2003-807541 [76] WPIX

DNN N2003-647279 DNC C2003-223698

TI Lead storage **battery** for truck, contains indium in  
**electrolyte** liquid and/or electrode active material compact.

DC A85 L03 X16 X22  
 PA (OZAW-I) OZAWA S; (TAGA-I) TAGAWA K

CYC 1  
 PI JP 2003151618 A 20030523 (200376)\* 4 H01M010-08 <--  
 ADT JP 2003151618 A JP 2001-382340 20011109

PRAI JP 2001-382340 20011109

IC ICM H01M010-08  
 ICS H01M004-62

AB JP2003151618 A UPAB: 20031125

NOVELTY - A lead storage **battery** contains 1-1,000 ppm of indium  
 in an **electrolyte** liquid and/or electrode active material  
 compact.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for additive  
 which contains 2 ppm or more of indium.

USE - Lead storage **battery** for trucks.

**ADVANTAGE** - The reduction of **battery** capacity due to repeated charging and discharging is prevented. The lead storage **battery** has prolonged life. The decomposition of inactive lead sulfate is promoted by preventing generation of hydrogen.

**DESCRIPTION OF DRAWING(S)** - The graph compares polarization property of **battery** comprising negative electrode containing indium with conventional **battery**. (Drawing includes non-English language text).

Dwg.1/1

TECH JP 2003151618 AUPTX: 20031125

**TECHNOLOGY FOCUS** - INORGANIC CHEMISTRY - Preferred Composition: The additive further contains 0.01-5% of **polyvinyl** alcohol, 0.01-2% of **polyethylene glycol**, 0.01-0.5% of **polymethyl acrylate** and/or 0.01-2% of **lignin**.

ABEX JP 2003151618 AUPTX: 20031125

**EXAMPLE** - A lead storage battery comprising 5% **polyvinyl** alcohol solution (50 cc) and mixed aqueous solution (10 cc) of tin sulfate and indium sulfate was manufactured. Reduction in capacitance was not observed even when the battery was repeatedly charged and discharged for 10 days.

FS CPI EPI

FA AB; GI

MC CPI: A12-E06; L03-E01B1

EPI: X16-B01B; X16-E04; X16-E09; X22-F01; X22-P05B

L47 ANSWER 9 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2003-605329 [57] WPIX

CR 1996-401583 [40]; 1997-131785 [12]; 1997-297340 [27]; 1997-513001 [47];  
2001-158272 [16]; 2001-354186 [37]; 2001-380246 [40]; 2001-496160 [54];  
2001-513669 [56]; 2001-513670 [56]; 2001-529015 [58]; 2001-549556 [61];  
2001-601149 [68]; 2003-502657 [47]; 2004-623304 [60]; 2004-632742 [61];  
2004-793559 [78]; 2004-831008 [82]

DNN N2003-482568 DNC C2003-164681

TI Negative plate element for lead acid **battery**, has negative active material and macroporous organic **polymer** **particles** having functional groups with affinity for lead and electrolyte soluble metal impurity ion(s) that are more noble than lead.

DC A85 L03 X16

IN CLOUGH, T J

PA (ENSC-N) ENSCI INC

CYC 1

PI US 6517969 B1 20030211 (200357)\* 11 H01M006-04 <--

ADT US 6517969 B1 Div ex US 1996-675395 19960702, CIP of US 1998-45726  
19980320, Div ex US 1998-98044 19980616, US 2001-865662 20010529

FDT US 6517969 B1 Div ex US 5759716, CIP of US 6190799, Div ex US 6268081

PRAI US 1998-98044 19980616; US 1996-675395 19960702;  
US 1998-45726 19980320; US 2001-865662 20010529

IC ICM H01M006-04

AB US 6517969 B UPAB: 20041223

**NOVELTY** - A negative plate element for a lead acid **battery**, comprises a negative active material and macroporous organic **polymer** **particles** with functional groups having an affinity over lead ion and electrolyte soluble metal impurity ion(s) nobler than lead. The **polymer** **particles** are in contact with the electrolyte to allow the ion to permeate the internal surface of the **polymer** **particles**.

**DETAILED DESCRIPTION** - A negative plate element useful in a lead acid **battery** comprises a negative active material, an organic expander and an acid resistant metal impurity-inhibiting amount of macroporous organic **polymer** **particles**. The macroporous organic

**polymer particles** have internal surfaces and functional groups on the internal surfaces. The functional groups have a preferential affinity over lead ions and for at least one **electrolyte** soluble metal impurity ion that is more noble than lead at the discharge charge electrochemical and sulfuric acid molarity conditions of the **battery** provided such that the metal impurity ion is not substantially detrimentally desorbed or released from the functional groups under the conditions. Soluble lead ion has a substantially reduced affinity for bonding with the functional groups. The organic microporous organic **polymer particles** are associated with the negative active material and in contact with the metal impurity ion-containing **electrolyte** to allow the ion to substantially permeate the internal surfaces of the macroporous organic **polymer particles**.

**USE** - The negative plate element is useful in a lead acid **battery**.

**ADVANTAGE** - The plate element inhibits the detrimental effect of soluble metal impurity on the negative plate. It has improved overall utilization efficiency and the utilization of sulfuric acid **electrolyte** during discharge of the **battery**. It has improved capacity maintenance of the negative active material in a lead acid **battery**.

Dwg.0/0

TECH US 6517969 B1 UPTX: 20030906

**TECHNOLOGY FOCUS - POLYMERS** - Preferred Component: The macroporous organic **polymer particles** have acid functional groups, which are metal impurity complexing.

**Preferred Polymer**: The macroporous organic **polymer particles** are crosslinked polystyrene and the crosslinking is by divinylbenzene. The macroporous organic **polymer particles** have thiouranium functional groups.

**TECHNOLOGY FOCUS - INORGANIC CHEMISTRY** - Preferred Component: The metal impurity comprises antimony, nickel, cobalt, iron or preferably silver.

**TECHNOLOGY FOCUS - ORGANIC CHEMISTRY** - Preferred Component: The organic expander comprises lignin sulfonic acid and/or lignin sulfonate.

**TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY** - Preferred Component: The negative plate element further comprises a macroporous additive **particle** with a reduced affinity for bonding with the negative active material for promoting **electrolyte** diffusion to the expander component and macroporous organic **polymer**.

ABEX US 6517969 B1 UPTX: 20030906

**EXAMPLE** - Negative paste batches were prepared by mixing dry Barton mill lead oxide (10 lbs), pasting fibers, an expander (a sulfonate lignin), barium sulfate and carbon black at a concentration of 2 weight% lead oxide at an expander weight ratio of 1.2 weight% lignosulfonate, 0.4 weight% barium sulfate and 0.4 weight% carbon black basis dry lead oxide and organic polymer having phosphonic functionality at a concentration of 2 weight% basis dry lead oxide for 5 minutes. The organic polymer having phosphonic functionality was crosslinked polystyrene having amino methylene phosphonic acid groups present on the aromatic rings. A measured quantity of water was added to make the paste precursor and was mixed. Pasting acid was continuously added to the paste precursor at a rate of 0.6-0.9 ml/second. For the negative paste mix, the pasting acid was added over 10-13 minutes. After acid addition was complete, the paste batch was mixed for an additional period of time to allow the temperature to be reduced to 110degreesF. The paste was applied to negative grids at a constant

thickness as determined by the grid thickness. Following pasting, the plates were cured in curing chambers, and the positive and negative plates, and separator was assembled into 2V cells. An improvement in capacity maintenance was obtained.

FS CPI EPI  
 FA AB  
 MC CPI: A12-E06A; L03-E01B1  
 EPI: X16-B01B; X16-E02; X16-E04; X16-E09

L47 ANSWER 10 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2003-597231 [56] WPIX  
 DNN N2003-475969 DNC C2003-161759  
 TI Manufacture of **battery** electrodes for **battery** for e.g. vehicles, involves calculating desired **battery** electrode porosity, creating paste mixture in response to porosity, applying paste mixture to grid, and curing electrode.  
 DC A85 L03 X16  
 IN BROST, R D; DEXTER, D R  
 PA (BROS-I) BROST R D; (DEXT-I) DEXTER D R; (FORD) FORD GLOBAL TECHNOLOGIES LLC  
 CYC 1  
 PI US 2003091898 A1 20030515 (200356)\* 19 H01M004-04 <--  
 US 6656234 B2 20031202 (200379) H01M004-04 <--  
 ADT US 2003091898 A1 US 2001-963255 20010926; US 6656234 B2 US 2001-963255 20010926  
 PRAI US 2001-963255 20010926  
 IC ICM H01M004-04  
 AB US2003091898 A UPAB: 20030903

NOVELTY - **Battery** electrodes are made by:  
 (a) calculating a desired **battery** electrode porosity;  
 (b) creating a paste mixture in response to the **battery** electrode porosity;  
 (c) applying the paste mixture to a grid to form an electrode; and  
 (d) curing the electrode.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a method of calculating a desired porosity of **battery** electrodes of a **battery** during manufacturing of the **battery** electrodes using an electrochemical model and a thermal model of a **battery**, comprising determining energy and current requirements of the **battery**; determining **battery** characteristics in response to the energy and current requirements; determining porosity of the **battery** electrodes by solving equations within the electrochemical model and the thermal model; varying porosity of the **battery** electrodes until voltage potential across the **battery** varies by less than a predetermined tolerance factor for an operating range state of change; creating a paste mixture in response to the optimum **battery** electrode porosity; applying the paste mixture to grid to form an electrode; and curing the electrode.

USE - For manufacturing **battery** electrodes for a **battery** for, e.g. vehicles.

ADVANTAGE - The method creates desirable **battery** electrode porosity for a given set of **battery** characteristics and application parameters.

DESCRIPTION OF DRAWING(S) - The figure shows a flow chart illustrating a method of manufacturing **battery** electrodes of a **battery**.

Dwg.1/10

TECH US 2003091898 A1UPTX: 20030903

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Method: The method further comprises solving equations that represent

electrolyte flow and diffusion and electrolyte permeability.

Preferred Condition: The desired **battery** electrode porosity is calculated by analyzing an application to determine application specific **battery** performance requirements. It also involves determining the appropriate elements, compounds and materials to use for the **battery** electrodes, and determining a desired **electrolyte** content. It is also calculated using an electronic simulation model or a computer. The porosity is varied by, adjusting the porosity of a **battery** component comprising an anode, a cathode, and a separator.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Material: The elements, compounds and materials to use for electrodes comprise sulfino-lignin, barium sulfate, lead dioxide, sulfuric acid, lead monoxide, water, carbon black, sodium sulfate, graphite, titanium sub-oxide, dispersant or red lead.

Preferred Component: The **electrolyte** comprises sodium sulfate, sulfuric acid or lead sulfate.

TECHNOLOGY FOCUS - POLYMERS - Preferred Material: The materials to be used for electrodes may also comprise plastic fibers or **polymer** fibers.

TECHNOLOGY FOCUS - CERAMICS AND GLASS - Preferred Material: The material to be used for electrodes may also be glass fiber.

FS CPI EPI  
 FA AB; GI  
 MC CPI: A11-B05; A11-C02C; A12-E06A; L03-E01B  
 EPI: X16-E; X16-E01G

L47 ANSWER 11 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2003-502657 [47] WPIX  
 CR 1996-401583 [40]; 1997-131785 [12]; 1997-297340 [27]; 1997-513001 [47];  
 2001-158272 [16]; 2001-354186 [37]; 2001-380246 [40]; 2001-496160 [54];  
 2001-513669 [56]; 2001-513670 [56]; 2001-529015 [58]; 2001-549556 [61];  
 2001-601149 [68]; 2003-605329 [57]; 2004-623304 [60]; 2004-632742 [61];  
 2004-793559 [78]; 2004-831008 [82]  
 DNN N2003-398925 DNC C2003-134186  
 TI Negative plate useful in lead acid **battery** comprises acid  
 resistant metal impurity inhibiting amount of macroporous organic  
**polymer particles** having internal surfaces and  
 chemically different functional groups.  
 DC A85 L03 X16  
 IN CLOUGH, T J  
 PA (ENSC-N) ENSCI INC  
 CYC 1  
 PI US 6511771 B1 20030128 (200347)\* 11 H01M006-04 <--  
 ADT US 6511771 B1 Div ex US 1996-675395 19960702, CIP of US 1998-45726  
 19980320, Div ex US 1998-98044 19980616, US 2001-865922 20010529  
 FDT US 6511771 B1 Div ex US 5759716, CIP of US 6190799, Div ex US 6268081  
 PRAI US 1998-98044 19980616; US 1996-675395 19960702;  
 US 1998-45726 19980320; US 2001-865922 20010529  
 IC ICM H01M006-04  
 AB US 6511771 B UPAB: 20041223  
 NOVELTY - A negative plate useful in a lead acid **battery**  
 comprises an organic expander and an acid resistant metal impurity  
 inhibiting amount of macroporous organic **polymer**  
**particles**, having internal surfaces and chemically different  
 functional groups on the internal surfaces.

DETAILED DESCRIPTION - A negative plate useful in lead acid

**battery** comprises negative active material, an organic expander, and an acid resistant metal impurity inhibiting amount of macroporous organic **polymer particles**, having internal surfaces and chemically different functional groups on the internal surfaces. The functional groups have a preferential affinity over lead ion for **electrolyte** soluble metal impurity ion(s) more nobler than lead at the discharge charge electrochemical and sulfuric acid molarity conditions of the **battery**. The metal impurity ion is not detrimentally desorbed or released from the functional groups under those conditions. The soluble lead ion has a reduced affinity for bonding with the functional groups. The macroporous organic **polymer particles** are associated with the negative active material, and in contact with the metal impurity ion containing **electrolyte**, to allow the ion to permeate the internal surfaces of the macroporous organic **polymer particles**.

USE - For lead acid **battery** (claimed).

ADVANTAGE - The detrimental effects of antimony on the inventive negative plate is inhibited. The invention has improved utilization efficiency of the active material, utilization of sulfuric acid **electrolyte** during discharge, and overall capacity maintenance of the negative active material of lead acid **battery**.

Dwg.0/0

TECH US 6511771 B1 UPTX: 20030723

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Component: The negative plate comprises a macroporous additive **particle** with a reduced affinity for bonding with the negative active material for promoting **electrolyte** diffusion to the expander component and the macroporous organic **polymers particles**.

TECHNOLOGY FOCUS - POLYMERS - Preferred Component: The macroporous organic **polymer particles** have aliphatic amine and acid functional groups.

Preferred Condition: The functionality is metal impurity complexing.

Preferred Material: The macroporous organic **polymer particles** are cross-linked polystyrene. The cross-linking is by divinylbenzene. The organic expander is lignin sulfonic acid, and/or lignin sulfonate.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Material: The metal impurity is silver, iron, nickel, cobalt, or preferably antimony.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Material: The aliphatic amine functional groups are from secondary amine, and/or tertiary amine.

ABEX US 6511771 B1 UPTX: 20030723

EXAMPLE - Negative paste batches were prepared by mixing (weight%) dry leady oxide basis: a dry barton mill leady oxide (2), pasting fibers, an expander comprising an organic expander (weight ratio of 1.2 weight% lignosulfate), barium sulfate (0.4) and carbon black (0.4), and an organic polymer (2) having phosphonic functionality, for approximately5 minutes. Water was added to make the paste precursor. Pasting acid was added. The paste batch was mixed for an additional period of time to allow the temperature to be reduced to 110degreesF. Pastes were applied to negative grids. The plates were cured, and positive and negative plates and separator were assembled into 2-volt cells, to obtain improvement in capacity maintenance.

FS CPI EPI

FA AB

MC CPI: A12-E06; L03-E01B9A

EPI: X16-E04

L47 ANSWER 12 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2002-285542 [33] WPIX  
 DNN N2002-223276 DNC C2002-083885  
 TI Lead storage **battery** for use in electric vehicle, has addition agent that contains polyacrylic acid or polyacrylic ester, in the **electrolyte** and molded active negative plate casting.  
 DC A14 A85 L03 X16  
 PA (MASE-I) MASE S; (OZAW-I) OZAWA A; (TAGA-I) TAGAWA K  
 CYC 1  
 PI JP 2001313064 A 20011109 (200233)\* 4 H01M010-08 <--  
 ADT JP 2001313064 A JP 2000-169775 20000428  
 PRAI JP 2000-169775 20000428  
 IC ICM H01M010-08  
 ICS H01M004-14; H01M004-62  
 AB JP2001313064 A UPAB: 20020524  
 NOVELTY - The lead storage **battery** has addition agent that contains polyacrylic acid, polyacrylic ester, **polyvinyl** alcohol, **soluble lignin**, sulfuric acid or colloidal lead sulfate, in the **electrolyte** and a molded active negative plate casting.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for addition agent for lead storage **battery**.

USE - For use in electric vehicle, UPS.

ADVANTAGE - Reduction of **battery** capacity due to repeated charging and discharging is prevented, due to the presence of the addition agent in the **electrolyte**, thus the life of **battery** is increased.

DESCRIPTION OF DRAWING(S) - The figure shows a comparison graph of hydrogen overvoltage of the **battery** addition agent with the conventional product. (Drawing includes non-English language text).

Dwg.1/2

FS CPI EPI  
 FA AB; GI  
 MC CPI: A03-C02; A04-F04; A04-F06E; A10-E09B; A12-E06; L03-E01B1; L03-E01C  
 EPI: X16-B01B; X16-E04; X16-E09; X16-J02; X16-J07

L47 ANSWER 13 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 2001-601149 [68] WPIX  
 CR 1996-401583 [40]; 1997-131785 [12]; 1997-297340 [27]; 1997-513001 [47];  
 2001-158272 [16]; 2001-354186 [37]; 2001-380246 [40]; 2001-496160 [54];  
 2001-513669 [56]; 2001-513670 [56]; 2001-529015 [58]; 2001-549556 [61];  
 2003-502657 [47]; 2003-605329 [57]; 2004-623304 [60]; 2004-632742 [61];  
 2004-793559 [78]; 2004-831008 [82]

DNN N2001-448376 DNC C2001-178161  
 TI Negative **battery** plate for lead acid **battery**, e.g. for vehicle, includes acid-resistant porous organic **polymer** having phosphonic functional groups and macroporous additive **particles**.

DC A85 L03 X16 X22  
 IN CLOUGH, T J  
 PA (ENSC-N) ENSCI INC  
 CYC 1  
 PI US 6268081 B1 20010731 (200168)\* 10 H01M004-60 <--  
 ADT US 6268081 B1 Div ex US 1996-675395 19960702, CIP of US 1998-45726  
 19980320, US 1998-98044 19980616  
 FDT US 6268081 B1 Div ex US 5759716, CIP of US 6190799  
 PRAI US 1998-98044 19980616; US 1996-675395 19960702;  
 US 1998-45726 19980320  
 IC ICM H01M004-60  
 AB US 6268081 B UPAB: 20041223  
 NOVELTY - A **battery** plate comprises a negative active material; an organic sulfonic **polymeric** expander component; an

acid-resistant porous organic polymer having phosphonic functional groups; and macroporous additive particles with reduced affinity for bonding with negative active material for promoting electrolyte diffusion to the expander and organic polymer

USE - For use in a lead acid battery e.g. for vehicle.

ADVANTAGE - The negative plate that includes an organic polymer having phosphonic functionality has improved capacity maintenance. The detrimental effect of soluble metal impurity on the negative plate is inhibited. The macroporous additive particles improve overall utilization efficiency and the utilization of sulfuric acid electrolyte during discharge of the battery.

Dwg.0/0

TECH US 6268081 B1 UPTX: 20011121

TECHNOLOGY FOCUS - POLYMERS - Preferred Polymer: The organic polymer has amino (bis)alkylene (preferably (bis)methylene) phosphonic functional groups. It is a polystyrene cross-linked by divinylbenzene.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Component: The organic expander is lignin sulfonic acid and/or lignin sulfonate.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Component: The battery plate further comprises barium sulfate.

ABEX US 6268081 B1 UPTX: 20011121

EXAMPLE - A negative paste was prepared by mixing lead oxide (10 pounds), sulfonated lignin as organic expander, barium sulfate, and carbon black, at a concentration of 2 weight% lead oxide in an expander weight ratio of 1.2 weight% sulfonated lignin, 0.4 weight% barium sulfate and 0.4 weight% carbon black (based on dry lead oxide), and an organic polymer having phosphonic functionality at a concentration of 2 weight% (based on dry lead oxide). The organic polymer was a cross-linked polystyrene having amino methylene phosphonic acid groups on the aromatic rings. The paste was applied to negative grid, cured, and assembled into a 2-volt cell. An improvement in capacity maintenance was obtained.

FS CPI EPI

FA AB

MC CPI: A12-E06; L03-E01B9

EPI: X16-B01B; X16-E09; X16-F02; X22-F01

L47 ANSWER 14 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2001-321031 [34] WPIX

DNN N2001-230773 DNC C2001-099101

TI Optoelectric conversion element for solar battery includes an organic polysilane compound conductive layer formed between an upper optoelectric layer carrying an electrode layer and a lower counterelectrode layer.

DC A26 A85 L03 U12 V01 X16

IN FUJITA, Y; KAWASE, Y

PA (SHAF) SHARP KK

CYC 2

PI JP 2001053355 A 20010223 (200134)\* 10 H01L051-10  
US 2003042472 A1 20030306 (200320) H01B001-00

ADT JP 2001053355 A JP 1999-224066 19990806; US 2003042472 A1 Div ex US  
2000-629838 20000731, US 2002-272935 20021018

PRAI JP 1999-224066 19990806

IC ICM H01B001-00; H01L051-10

ICS H01G009-00; H01G009-20; H01L031-04; H01L031-08; H01M014-00

AB JP2001053355 A UPAB: 20010620

NOVELTY - An optoelectric conversion element is formed by laying up an electrode layer, a first optoelectric conversion layer, an conductive layer, and a counter electrode layer in that order. The conductive layer consists of an organic polysilane.

USE - The method produces the optoelectric conversion element used for the solar **battery**.

ADVANTAGE - The use of the organic polysilane for the conductive layer exhibits high mechanical strength and eliminates the need for an **electrolytic** solution. The resulting optoelectric conversion element has no liquid leakage, and has long-term stability and high reliability.

Dwg.0/2

TECH JP 2001053355 AUPTX: 20010620

TECHNOLOGY FOCUS - **POLYMERS** - The polysilane consists of formula (1).

R1, R2, R3, R4 = aliphatic hydrocarbon residue which may have substituent, aromatic hydrocarbon residue, or alicyclic hydrocarbon residue;

n, m = integer.

The production of the optoelectric conversion element comprises:

- (a) laying up the first optoelectric conversion layer, the conductive layer consisting of the organic polysilane, and the counter electrode layer in that order on the electrode layer;
- (b) applying a voltage to the electrode layer and the counter electrode layer;
- (c) aligning the organic polysilane.

A solar **battery** has the optoelectric conversion element.

FS CPI EPI

FA AB; GI

MC CPI: A06-A00E2; A12-E11B; L03-E05B; L04-E05  
EPI: U12-A02A; V01-B01; V01-B01C; X16-D

L47 ANSWER 15 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2000-610635 [58] WPIX

DNN N2000-452148 DNC C2000-182527

TI Fabricating an amorphous carbon material, comprises mixing a lignin material with a salt, and heating the lignin and salt mixture comprising sodium sulfate.

DC A85 E19 L03 V01 X15 X16

IN DENTON, F R; SMITH, D R

PA (MOTI) MOTOROLA INC

CYC 1

PI US 6099990 A 20000808 (200058)\* 22 H01M004-58 <--

ADT US 6099990 A US 1998-48634 19980326

PRAI US 1998-48634 19980326

IC ICM H01M004-58

AB US 6099990 A UPAB: 20001114

NOVELTY - Improved carbon material for electrochemical cells using precursor material having high char yield so as to yield high amorphous material.

DETAILED DESCRIPTION - Fabricating an amorphous carbon material comprises:

- (a) mixing a lignin material with a salt; and
- (b) heating the lignin and salt mixture comprising sodium sulfate.

INDEPENDENT CLAIMS are also included for:

- (1) the method as above where the salt mixture comprises polymerizable ion(s);
- (2) mixing a salt with an organic material selected from phenolphthalein, 1-aminoanthraquinone, fluorescein and/or pyromellitic

diimide, and heating the salt and organic material together.

USE - Used for batteries, capacitors, electrolytic cells, photovoltaic cells, sensors, fuel cells etc., filters, carbon-based media for fillers, adsorbants, and inks.

ADVANTAGE - The improved carbon material are fabricated from relatively inexpensive, readily available and renewable precursor material.

DESCRIPTION OF DRAWING(S) - Figure 1 is a schematic representation of an electrochemical cell including an electrode made of the claimed carbon material.

electrochemical cell 10

anode 20

cathode 30

electrolyte 40

Dwg.1/12

TECH US 6099990 A UPTX: 20001114

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Salt: The salt comprises a cation and anion, the anion selected from (meth)acrylate, vinyl sulfonate, 4-styrenesulfonate, methyl-4-oxybenzoate and/or acetylide.

The cation is selected from N-methyl-4-viylpyridinium, alpha,alpha'-bis-(tetrahydrothiophenio)-xylene and/or allyl trimethylammonium.

The salt preferably comprises sodium acrylate.

Preferred Method: The method comprises adding a polymerization initiator (0.001 - 5.0 wt.%) to the lignin and salt mixture.

The initiator comprises dialkyl peroxide and/or azobis-isobutyronitrile.

FS CPI EPI

FA AB; GI; DCN

MC CPI: A03-C02; A10-E05B; A12-E01; A12-W12G; E31-N03; L03-E01B3

EPI: V01-B01A; V01-B01C; V01-B01D; V01-B01X; X15-A02A; X16-C; X16-E01C

L47 ANSWER 16 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2000-516267 [47] WPIX

DNN N2000-381713 DNC C2000-154107

TI Polymer secondary battery production comprises immersing the cathode, anode and porous film in a liquid electrolyte.

DC A14 A85 L03 X16

IN IIJIMA, T; KOBAYASHI, M; MARUYAMA, S; MIYAKOSHI, T

PA (DENK) TDK CORP

CYC 30

PI EP 1032059 A1 20000830 (200047)\* EN 15 H01M002-16 <--  
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI

JP 2000311712 A 20001107 (200061) 10 H01M010-40 <--

CN 1265524 A 20000906 (200065) H01M010-38 <--

KR 2000071353 A 20001125 (200131) H01M010-40 <--

JP 3297034 B2 20020702 (200246) 10 H01M010-40 <--

TW 459411 A 20011011 (200247) H01M002-14 <--

JP 2002184468 A 20020628 (200258) 10 H01M010-40 <--

US 6534219 B1 20030318 (200322) H01M002-14 <--

KR 367284 B 20030109 (200338) H01M010-40 <--

US 2003108797 A1 20030612 (200340) H01M002-16 <--

ADT EP 1032059 A1 EP 2000-301336 20000221; JP 2000311712 A JP 2000-36761  
20000215; CN 1265524 A CN 2000-102386 20000222; KR 2000071353 A KR  
2000-7632 20000217; JP 3297034 B2 JP 2000-36761 20000215; TW 459411 A TW  
2000-102975 20000221; JP 2002184468 A Div ex JP 2000-36761 20000215, JP  
2001-340741 20000215; US 6534219 B1 US 2000-506688 20000218; KR 367284 B  
KR 2000-7632 20000217; US 2003108797 A1 Div ex US 2000-506688 20000218, US

2003-347744 20030122

FDT JP 3297034 B2 Previous Publ. JP 2000311712; KR 367284 B Previous Publ. KR 2000071353; US 2003108797 A1 Div ex US 6534219

PRAI JP 1999-43441 19990222

IC ICM H01M002-14; H01M002-16; H01M010-38;  
H01M010-40

ICS H01M002-08; H01M004-02; H01M004-62;  
H01M010-04

AB EP 1032059 A UPAB: 20000925

NOVELTY - Producing a secondary **battery** comprises aligning a cathode and anode with a porous film and fixing parts of the cathode and anode to the porous film, immersing the cathode, anode and porous film in a liquid **electrolyte**, and integrating the electrodes with the porous film by compression.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the secondary **battery** itself.

USE - None given.

ADVANTAGE - A thin and lightweight **polymer** secondary **battery** or other secondary **battery** can be produced at low cost.

DESCRIPTION OF DRAWING(S) - The drawing shows a flow chart showing the production process.

Dwg.1/3

TECH EP 1032059 A1 UPTX: 20000925

TECHNOLOGY FOCUS - **POLYMERS** - The porous film contains a **polymer**, at least part of which is gelled by immersion in the liquid **electrolyte** into a solid **electrolyte**.

FS CPI EPI

FA AB; GI

MC CPI: A12-E06; L03-E03  
EPI: X16-B01; X16-F02

L47 ANSWER 17 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 2000-161200 [14] WPIX

DNN N2000-120224 DNC C2000-050495

TI Lithium secondary **battery** used in e.g. compact disc players, includes electrodes containing hole patterns filled with **polymeric** material which presses the electrodes and separator together .

DC A17 A85 L03 X16

IN HIKMET, R A M

PA (PHIG) KONINK PHILIPS ELECTRONICS NV

CYC 21

PI WO 2000004601 A1 20000127 (200014)\* EN 23 H01M010-12 <--  
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
W: JP

EP 1038329 A1 20000927 (200048) EN H01M010-12 <--  
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

EP 1038329 B1 20020206 (200211) EN H01M010-12 <--  
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DE 69900860 E 20020321 (200227) H01M010-12 <--

US 6432576 B1 20020813 (200255) H01M002-00 <--

JP 2002520803 W 20020709 (200259) 26 H01M010-40 <--  
ES 2172340 T3 20020916 (200270) H01M010-12 <--

ADT WO 2000004601 A1 WO 1999-EP4716 19990702; EP 1038329 A1 EP 1999-932835 19990702, WO 1999-EP4716 19990702; EP 1038329 B1 EP 1999-932835 19990702, WO 1999-EP4716 19990702; DE 69900860 E DE 1999-600860 19990702, EP 1999-932835 19990702, WO 1999-EP4716 19990702; US 6432576 B1 US 1999-352314 19990712; JP 2002520803 W WO 1999-EP4716 19990702, JP 2000-560628 19990702; ES 2172340 T3 EP 1999-932835 19990702

FDT EP 1038329 A1 Based on WO 2000004601; EP 1038329 B1 Based on WO

20000004601; DE 69900860 E Based on EP 1038329, Based on WO 2000004601; JP 2002520803 W Based on WO 2000004601; ES 2172340 T3 Based on EP 1038329

PRAI EP 1998-202387 19980716

IC ICM H01M002-00; H01M010-12; H01M010-40  
ICS H01M002-02; H01M002-18; H01M006-12;  
H01M010-04

ICA H01M004-70

AB WO 200004601 A UPAB: 20000320

NOVELTY - A lithium secondary **battery** comprises: electrodes having negative and positive electrode materials (2,5) and current collectors (3,6); a separator (7) between the electrodes; and a non-aqueous **electrolyte** solution. The electrode materials are provided with a pattern of holes. The holes are filled with **polymeric** material which sticks and presses the electrodes and the separator together.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of manufacturing a lithium secondary **battery**. The method includes:

- (a) applying negative and positive electrode materials (2, 5) onto negative and positive current collector (3, 6) to form the negative and positive electrodes (1, 4);
- (b) arranging a separator (7) between the two electrodes;
- (c) making a pattern of holes (8, 9, 10) through the negative and positive electrodes, and in the separator;
- (d) aligning the pattern of holes in the stack to form overlapping holes;
- (e) providing a **polymer** film having a pattern of piles (12) on at least one of its surfaces;
- (f) placing the stack on the **polymer** film; and
- (g) subjecting the stack and the **polymer** film to heat and pressure to flatten out the projected piles in order to form a laminate structure.

USE - The **battery** is used in lightweight, portable cordless consumer products, e.g. compact disc (CD) players, mobile telephones, laptop computers and video cameras.

ADVANTAGE - The **battery** provides a flexible and thin lithium secondary **battery** which ensures good contact between the electrodes and the **electrolyte**.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic cross-sectional view of a **battery** during manufacture.

Negative electrode 1

Negative electrode material 2

Current collectors 3, 6

Positive electrode 4

Positive electrode material 5

Separator 7

Holes 8, 9, 10

Piles 12

Dwg.1/3

TECH WO 200004601 A1UPTX: 20000320

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Component: The current collectors and the separator are provided with a pattern of holes which overlaps the holes in the electrode materials. The holes of both patterns are filled with **polymeric** material. The **battery** comprises a multilayer stack of layers of the negative electrode, separator and the positive electrode. The surface of the negative electrode facing away from the separator is provided with a resilient foam layer.

TECHNOLOGY FOCUS - POLYMERS - Preferred Material: The

polymeric material is an adhesive, preferably polyethylene.

FS CPI EPI

FA AB; GI

MC CPI: A12-E06; L03-E03  
EPI: X16-A01A; X16-B01; X16-B01B; X16-F01; X16-F02

L47 ANSWER 18 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

AN 1988-309284 [44] WPIX

CR 1988-316449 [45]; 1988-339647 [48]

DNN N1990-058294 DNC C1990-006668

TI Thermoplastic spun conjugate fibre - containing crystalline poly-alpha-olefin and ethylene copolymer, has excellent retention of acid aqueous soln, thermal adhesion and dyeability..

DC A32 F01 P73 X16

IN ASAO, S K; OHMAE, T; SAKURAI, T; ASAO, K; OKADA, M

PA (SUMO) SUMITOMO CHEM IND KK; (SUMO) SUMITOMO CHEM CO LTD

CYC 16

PI EP 289330 A 19881102 (198844)\* EN 7  
R: BE CH DE FR GB IT LI NL

AU 8815313 A 19881103 (198901)

BR 8802095 A 19881129 (198902)

JP 01054041 A 19890301 (198915)

JP 01077882 A 19890323 (198918)

US 4840847 A 19890620 (198931) 5

AU 8816123 A 19890810 (198940)

US 4859710 A 19890822 (198942) 10

BR 8802301 A 19891205 (199003)

JP 01314729 A 19891219 (199005)

CN 1031381 A 19890301 (199008)

US 4957660 A 19900918 (199040)

US 5009951 A 19910423 (199120)

CA 1295797 C 19920218 (199214)

JP 05047643 B 19930719 (199331) 6 D01F008-06

EP 289330 B1 19930901 (199335) EN 9 D01F008-06  
R: AT BE CH DE FR GB IT LI NL

DE 3883591 G 19931007 (199341) D01F008-06

JP 2508182 B2 19960619 (199629) 7 C08J007-06

KR 9411588 B1 19941222 (199643) D04H001-42

JP 2545878 B2 19961023 (199647) 8 H01M010-10 <--

ADT EP 289330 A EP 1988-303886 19880428; JP 01054041 A JP 1988-96531 19880418;  
JP 01077882 A JP 1987-235452 19870918; US 4840847 A US 1988-189439  
19880502; BR 8802301 A BR 1988-2301 19880512; JP 01314729 A JP 1988-96530  
19880418; US 4957660 A US 1988-188781 19880429; US 5009951 A US  
1989-337602 19890413; JP 05047643 B JP 1988-96530 19880418; EP 289330 B1  
EP 1988-303886 19880428; DE 3883591 G DE 1988-3883591 19880428, EP  
1988-303886 19880428; JP 2508182 B2 JP 1988-96531 19880418; KR 9411588 B1  
KR 1988-5496 19880512; JP 2545878 B2 JP 1987-235452 19870918

FDT JP 05047643 B Based on JP 01314729; DE 3883591 G Based on EP 289330; JP  
2508182 B2 Previous Publ. JP 01054041; JP 2545878 B2 Previous Publ. JP  
01077882

PRAI JP 1988-96530 19880418; JP 1987-109508 19870430;  
JP 1987-160246 19870626; JP 1988-25466 19880204;  
JP 1988-96531 19880418; JP 1987-235452 19870918

REP No-SR.Pub; FR 2368554; US 4211819; US 4285748

IC B32B027-02; D01F008-06; D02G003-00; D04H001-42; H01M002-16  
ICM C08J007-06; D01F008-06; D04H001-42; H01M010-10  
ICS B32B027-02; C08F210-02; C08F220-60; C08L033-24; D01F008-04;  
D01F008-10; D02G003-00; D04H001-54; H01B001-20; H01M002-16

AB EP 289330 A UPAB: 19971013  
A conjugate fibre is obtd. by melt spinning a mixture of (A) a crystalline

poly-lapha-olefin (pref. polypropylene) and (B) an ethylene copolymer containing 40-95 weight% of an ethylene unit and 5-60 weight% of at least one dialkylaminoalkylacrylamide comonomer unit of formula:  $\text{CH}_2-\text{C}(\text{R}1)-\text{CO}-\text{NH}-\text{CnH}_2\text{n}-\text{N}(\text{R}2)\text{R}3$  wherein R1 = hydrogen, methyl; R2, R3 = 1-4C alkyl; n = 2-5; and having a melt index of 10-1000 g/10 min. (pref. 30-5000 g/10 min.; measuring according to JIS K-6760); either by aligning the components (A) and (B) in parallel or by aligning (A) as a core and (B) as a sheath.

A non-woven moulding is obtd. by a melt spinning process as above, so as to prepare conjugate fibres, and then thermally adhering the resulting conjugate fibres at a temperature no lower than the m.pt. of (B) and no higher than the m.pt. of (A). A lead accumulator battery containing separators containing a non-woven fabric as above is also claimed. The dialkylaminoalkylacrylamide derivative is selected from dimethylaminopropylacrylamide, dimethylaminoethylmethacrylamide, dimethylaminoethylacrylamide, dimethylaminoethylmethacrylamide. The weight ratio of (A): (B) is 40:60-60:40.

ADVANTAGE - This fibre is excellent in retention of an acid aqueous solution, dyeability and thermal adhesion. It is promising as a material for functional nonwoven fabrics, filters, and the like that are suited for use as separators of lead accumulators, as well as water purifying cloth, simplified cloths, etc..

Dwg.0/0

FS CPI EPI GMPI  
 FA AB; GI  
 MC CPI: A04-D04; A04-G01E; A04-G08; A11-B15B; A12-S05B; A12-S05G; F01-C03;  
       F01-D05; F01-E01; F02-C02; F02-C02B; F04-E  
       EPI: X16-B01B; X16-F02

L47 ANSWER 19 OF 19 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN  
 AN 1975-02836W [02] WPIX  
 TI Pasted anode plate of lead storage battery - activated with fibrous lignins.  
 DC L03 X16  
 PA (NIST) JAPAN STORAGE BATTERY CO LTD  
 CYC 1  
 PI JP 49045891 B 19741206 (197502)\*  
 PRAI JP 1969-32166 19690424  
 IC H01M035-02  
 AB JP 74045891 B UPAB: 19930831  
 Lead storage battery consists of an anode of Pb, an electrolyte of dilute sulphuric acid and a cathode of PbO<sub>2</sub>. The PbO<sub>2</sub> cathode is formed around a metal plate of lead (alloy) leading to a terminal. An additive is added to the anode activator of PbO<sub>2</sub> to prevent it falling from the anode plate and to improve discharge property of the lead storage battery. The anode plate comprises a lattice lead plate with a dilute acid and lead cpd. paste. The anode activator contains fibrous lignins, part of which may be carbonized to form carbon black to improve the discharge property. Lignins, e.g. thiolignin, are dissolved in a solvent, e.g. glycol, amine or coal tar, to form a spinning solution. The lignin fibres are spun from the spinning solution. The lignin fibres may be heated at 200-1800 degrees C for 10 mins. -4 hrs. to carbonize the fibres partially. The fibres are dispersed evenly in the activator.

FS CPI EPI  
 FA AB  
 MC CPI: L03-E01B

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          /BI OR 7440-31-5/BI OR 7440-36-0/BI OR 7440-74-6/BI OR
          7446-14-2/BI OR 7631-86-9/BI OR 7727-43-7/BI OR 9002-89-5/BI
          OR 9003-01-4/BI OR 9005-53-2/BI)
L3      4 SEA FILE=REGISTRY ABB=ON L2 AND PMS/CI
L7      774 SEA FILE=REGISTRY ABB=ON LIGNIN
L10     58458 SEA FILE=REGISTRY ABB=ON 79-10-7/CRN
L11     1 SEA FILE=REGISTRY ABB=ON "CONIFERYL ALCOHOL"/CN
L12     1 SEA FILE=REGISTRY ABB=ON SYRINGENIN/CN
L14     34340 SEA FILE=REGISTRY ABB=ON 107-21-1/CRN
L15     905 SEA FILE=REGISTRY ABB=ON L10 AND L14
L17     4251 SEA FILE=REGISTRY ABB=ON 557-75-5/CRN
L18     386 SEA FILE=REGISTRY ABB=ON L10 AND L17
L19     76467 SEA FILE=HCAPLUS ABB=ON L7 OR ?LIGNIN? OR ?LIGNO?
L20     688 SEA FILE=HCAPLUS ABB=ON L19 AND ELECTROLYT?
L21     1603 SEA FILE=HCAPLUS ABB=ON L11 OR L12 OR CONIFERYL ALC? OR
          SYRINGENIN?
L22     8 SEA FILE=HCAPLUS ABB=ON L21 AND ELECTROLYT?
L23     136 SEA FILE=HCAPLUS ABB=ON (L20 OR L22) AND ?POLYMER?
L24     15 SEA FILE=HCAPLUS ABB=ON L23 AND BATTER?
L25     23 SEA FILE=HCAPLUS ABB=ON L23 AND ELECTROCHEMICAL/SC
L26     24 SEA FILE=HCAPLUS ABB=ON L24 OR L25
L29     3 SEA FILE=REGISTRY ABB=ON L3 NOT LIGNIN?
L31     31 SEA FILE=HCAPLUS ABB=ON (L20 OR L22) AND (L29 OR L10 OR L14
          OR L15 OR L17 OR L18)
L32     10 SEA FILE=HCAPLUS ABB=ON L31 AND ELECTROCHEMICAL/SC, SX
L33     10 SEA FILE=HCAPLUS ABB=ON L31 AND BATTER?
L34     28 SEA FILE=HCAPLUS ABB=ON L26 OR L32 OR L33
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FILE LAST UPDATED: 30 JAN 2006 <20060130/UP>  
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN  
THE BASIC INDEX >>>

=> d que 148  
L40 52716 SEA FILE=WPIX ABB=ON ?LIGNIN? OR ?LIGNO? OR CONFERYL ALC? OR  
SYRINGENIN?  
L41 1596 SEA FILE=WPIX ABB=ON L40 AND (POLYACRYL OR POLYVINYL? OR  
?GLYCOL?)  
L42 4776 SEA FILE=WPIX ABB=ON L40 AND ?POLYMER?  
L43 110 SEA FILE=WPIX ABB=ON (L41 OR L42) AND ELECTROLYT?  
L48 3 SEA FILE=COMPENDEX ABB=ON L43 AND BATTER?

=> file jicst  
FILE 'JICST-EPLUS' ENTERED AT 12:06:38 ON 03 FEB 2006  
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FILE COVERS 1985 TO 31 JAN 2006 (20060131/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED  
TERM (/CT) THESAURUS RELOAD.

=> d que 149  
L40 52716 SEA FILE=WPIX ABB=ON ?LIGNIN? OR ?LIGNO? OR CONFERYL ALC? OR  
SYRINGENIN?  
L41 1596 SEA FILE=WPIX ABB=ON L40 AND (POLYACRYL OR POLYVINYL? OR  
?GLYCOL?)  
L42 4776 SEA FILE=WPIX ABB=ON L40 AND ?POLYMER?  
L43 110 SEA FILE=WPIX ABB=ON (L41 OR L42) AND ELECTROLYT?  
L49 2 SEA FILE=JICST-EPLUS ABB=ON L43 AND BATTER?

=> file inspec  
FILE 'INSPEC' ENTERED AT 12:06:54 ON 03 FEB 2006  
Compiled and produced by the IEE in association with FIZ KARLSRUHE  
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FILE LAST UPDATED: 30 JAN 2006 <20060130/UP>  
FILE COVERS 1969 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN  
THE BASIC INDEX >>>

=> d que 150  
L40 52716 SEA FILE=WPIX ABB=ON ?LIGNIN? OR ?LIGNO? OR CONFERYL ALC? OR  
SYRINGENIN?  
L41 1596 SEA FILE=WPIX ABB=ON L40 AND (POLYACRYL OR POLYVINYL? OR  
?GLYCOL?)  
L42 4776 SEA FILE=WPIX ABB=ON L40 AND ?POLYMER?  
L43 110 SEA FILE=WPIX ABB=ON (L41 OR L42) AND ELECTROLYT?  
L50 1 SEA FILE=INSPEC ABB=ON L43 AND BATTER?

=> file japi0  
FILE 'JAPI0' ENTERED AT 12:07:09 ON 03 FEB 2006

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FILE LAST UPDATED: 02 JAN 2006 <20060102/UP>  
FILE COVERS APR 1973 TO SEPTEMBER 29, 2005

>>> GRAPHIC IMAGES AVAILABLE <<<

>>> NEW IPC8 DATA AND FUNCTIONALITY NOT YET AVAILABLE IN THIS FILE.  
USE IPC7 FORMAT FOR SEARCHING THE IPC. WATCH THIS SPACE FOR FURTHER  
DEVELOPMENTS AND SEE OUR NEWS SECTION FOR FURTHER INFORMATION  
ABOUT THE IPC REFORM <<<

=> d que 151

L40 52716 SEA FILE=WPIX ABB=ON ?LIGNIN? OR ?LIGNO? OR CONFERYL ALC? OR  
SYRINGENIN?  
L41 1596 SEA FILE=WPIX ABB=ON L40 AND (POLYACRYL OR POLYVINYL? OR  
?GLYCOL?)  
L42 4776 SEA FILE=WPIX ABB=ON L40 AND ?POLYMER?  
L43 110 SEA FILE=WPIX ABB=ON (L41 OR L42) AND ELECTROLYT?  
L51 9 SEA FILE=JAPIO ABB=ON L43 AND BATTER?

=> dup rem 134 148 149 150 151

FILE 'HCAPLUS' ENTERED AT 12:07:36 ON 03 FEB 2006  
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FILE 'COMPENDEX' ENTERED AT 12:07:36 ON 03 FEB 2006

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FILE 'JICST-EPLUS' ENTERED AT 12:07:36 ON 03 FEB 2006

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FILE 'INSPEC' ENTERED AT 12:07:36 ON 03 FEB 2006

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FILE 'JAPIO' ENTERED AT 12:07:36 ON 03 FEB 2006

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PROCESSING COMPLETED FOR L34

PROCESSING COMPLETED FOR L48

PROCESSING COMPLETED FOR L49

PROCESSING COMPLETED FOR L50

PROCESSING COMPLETED FOR L51

L52 38 DUP REM L34 L48 L49 L50 L51 (5 DUPLICATES REMOVED)

=> d 152 all hitstr 1-38

L52 ANSWER 1 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:394616 HCAPLUS

DN 142:449363

ED Entered STN: 09 May 2005

TI Immobilized enzymes in biocathodes

IN Minteer, Shelley D.; Topcagic, Sabina; Treu, Becky

PA St. Louis University, USA

SO U.S. Pat. Appl. Publ., 38 pp.

CODEN: USXXCO

DT Patent  
 LA English  
 IC ICM H01M004-86  
 ICS H01M008-00

INCL 429012000; 429013000; 429042000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 7

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005095466	A1	20050505	US 2004-931147	20040831
	WO 2005093888	A2	20051006	WO 2004-US37151	20041104
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
PRAI	US 2003-517626P	P	20031105		
	US 2004-931147	A	20040831		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US	2005095466	ICM	H01M004-86
		ICS	H01M008-00
		INCL	429012000; 429013000; 429042000
		IPCI	H01M0004-86 [ICM, 7]; H01M0008-00 [ICS, 7]
		NCL	429/012.000
		ECLA	H01M004/86B; H01M008/16
WO	2005093888	IPCI	H01M0008-16 [ICM, 7]; H01M0004-90 [ICS, 7]
		ECLA	H01M004/86B; H01M008/16

OS MARPAT 142:449363

AB Disclosed is an improved biofuel cell having a cathode comprising a dual function membrane, which contains an oxygen oxidoreductase enzyme immobilized within a buffered compartment of the membrane and an electron transport mediator which transfers electrons from an electron-conducting electrode to the redox reaction catalyzed by the oxygen oxidoreductase enzyme. The improved biofuel cell also has an anode that contains an oxidoreductase enzyme that uses an organic fuel, such as alc., as a substrate. An elec. current can flow between the anode and the cathode.

ST fuel cell immobilized enzyme biocathode

IT Carbohydrates, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (aldoses, fuel; immobilized enzymes in biocathodes)

IT Quaternary ammonium compounds, uses

RL: DEV (Device component use); USES (Uses)  
 (alkyltrimethyl; immobilized enzymes in biocathodes)

IT Alcohols, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (aralkyl, fuel; immobilized enzymes in biocathodes)

IT Fuel cells

(biochem. fuel cells; immobilized enzymes in biocathodes)

IT Nanotubes

(carbon, elec. conductor; immobilized enzymes in biocathodes)

IT Organic compounds, uses  
RL: DEV (Device component use); USES (Uses)  
(conjugated; immobilized enzymes in biocathodes)

IT Semiconductor materials  
(elec. conductor; immobilized enzymes in biocathodes)

IT Carbon black, uses  
Carbon fibers, uses  
Carbonaceous materials (technological products)

Metals, uses  
Oxides (inorganic), uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(elec. conductor; immobilized enzymes in biocathodes)

IT Catalysts  
(electrocatalysts; immobilized enzymes in biocathodes)

IT Carbon fibers, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(fabrics, elec. conductor; immobilized enzymes in biocathodes)

IT Polyoxyalkylenes, uses  
RL: DEV (Device component use); USES (Uses)  
(fluorine- and sulfo-containing, ionomers; immobilized enzymes in biocathodes)

IT Aldehydes, uses  
Amino acids, uses  
Fatty acids, uses  
Flavins  
Lipids, uses  
Steroids, uses  
Sterols  
RL: TEM (Technical or engineered material use); USES (Uses)  
(fuel; immobilized enzymes in biocathodes)

IT Micelles  
(immobilization material; immobilized enzymes in biocathodes)

IT Electric conductors  
Fuel cell cathodes  
(immobilized enzymes in biocathodes)

IT Peroxides, processes  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(immobilized enzymes in biocathodes)

IT Carbohydrates, uses  
Coenzymes  
Quaternary ammonium compounds, uses  
Viologens  
RL: DEV (Device component use); USES (Uses)  
(immobilized enzymes in biocathodes)

IT Fluoropolymers, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(immobilized enzymes in biocathodes)

IT Enzymes, uses  
RL: DEV (Device component use); USES (Uses)  
(immobilized; immobilized enzymes in biocathodes)

IT Alcohols, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(long-chain, fuel; immobilized enzymes in biocathodes)

IT Proteins  
RL: DEV (Device component use); USES (Uses)  
(metalloproteins; immobilized enzymes in biocathodes)

IT Cations  
(organic; immobilized enzymes in biocathodes)

IT Sulfonic acids, uses

IT RL: TEM (Technical or engineered material use); USES (Uses)  
 (perfluoro, copolymer with PTFE, immobilization material;  
 immobilized enzymes in biocathodes)

IT Fuel cells  
 (polymer electrolyte, membrane; immobilized enzymes  
 in biocathodes)

IT Fluoropolymers, uses  
 RL: DEV (Device component use); USES (Uses)  
 (polyoxyalkylene-, sulfo-containing, ionomers; immobilized enzymes in  
 biocathodes)

IT Ionomers  
 RL: DEV (Device component use); USES (Uses)  
 (polyoxyalkylenes, fluorine- and sulfo-containing; immobilized enzymes in  
 biocathodes)

IT Proteins  
 RL: DEV (Device component use); USES (Uses)  
 (stellacyanins; immobilized enzymes in biocathodes)

IT Perfluoro compounds  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (sulfonic acids, copolymer with PTFE, immobilization  
 material; immobilized enzymes in biocathodes)

IT 9031-72-5, Alcohol dehydrogenase  
 RL: DEV (Device component use); USES (Uses)  
 (PQQ-dependent; immobilized enzymes in biocathodes)

IT 9035-73-8, Oxidase  
 RL: DEV (Device component use); USES (Uses)  
 (alc.-based; immobilized enzymes in biocathodes)

IT 7782-40-3, Diamond, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (elec. conductor coated with; immobilized enzymes in biocathodes)

IT 50-00-0, Formaldehyde, uses 50-28-2, Estradiol, uses 50-99-7,  
 D-Glucose, uses 53-57-6, NADPH 56-73-5, Glucose-6-phosphate 56-81-5,  
 Glycerol, uses 57-60-3, Pyruvate, uses 58-22-0, Testosterone  
 58-68-4, NADH 64-17-5, Ethanol, uses 67-56-1, Methanol, uses  
 67-63-0, Isopropanol, uses 71-47-6, Formate, uses 71-50-1, Acetate,  
 uses 72-89-9, Acetyl co-A 75-07-0, Acetaldehyde, uses 78-83-1,  
 Isobutanol, uses 79-33-4, uses 85-61-0, Coenzyme A, uses 87-78-5,  
 Mannitol 96-41-3, Cyclopentanol 104-54-1, Cinnamyl alcohol 107-18-6,  
 Allyl alcohol, uses 113-21-3, Lactate, uses 116-31-4, Retinal  
 123-72-8, Butanal 126-44-3, Citrate, uses 149-61-1, Malate 320-77-4  
 383-86-8, Glycerate 458-35-5, Coniferyl  
 alcohol 608-59-3, Gluconate 820-11-1 921-60-8, L-Glucose  
 1333-74-0, Hydrogen, uses 1643-19-2, Tetrabutylammonium bromide  
 2002-48-4, Glucuronate 3615-39-2, Sorbose 7664-41-7, Ammonia, uses  
 10326-41-7, uses 26264-14-2, Propanediol 26566-61-0, Galactose  
 29354-98-1, Hexadecanol 30237-26-4, Fructose 31103-86-3, Mannose  
 35296-72-1, Butanol 62309-51-7, Propanol 157663-13-3, L-Gluconic acid  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (fuel; immobilized enzymes in biocathodes)

IT 9002-84-0D, PTFE, copolymer with modified perfluorosulfonic acid  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (immobilization material; immobilized enzymes in biocathodes)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses  
 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium  
 , uses 7440-48-4D, Cobalt, complex  
 RL: CAT (Catalyst use); USES (Uses)  
 (immobilized enzymes in biocathodes)

IT 7782-44-7, Oxygen, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)

(immobilized enzymes in biocathodes)

IT 603-35-0D, Triphenylphosphine, salts 635-65-4, Bilirubin, uses  
 1910-42-5, Methyl viologen 3546-21-2, Ethidium 7773-52-6,  
 Hexadecylpyridinium 9001-16-5, Cytochrome c oxidase 9001-37-0, Glucose  
 oxidase 9003-99-0, Peroxidase 9055-15-6, Oxidoreductase 12678-01-2D,  
 Phenanthroline, metal complex 13096-46-3, Benzyl viologen 13479-49-7  
 14708-99-7, Tris(1,10-phenanthroline)iron(2+) 14798-03-9, Ammonium, uses  
 15158-62-0, Tris(2,2'-bipyridine)ruthenium(2+) 16749-13-6, Phosphonium  
 16969-45-2, Pyridinium 17009-90-4, Imidazolium 22873-66-1,  
 Tris(1,10-phenanthroline)ruthenium(2+) 23648-06-8, Tris(2,2'-  
 bipyridine)osmium(2+) 37275-48-2D, Bipyridyl, metal complex  
 48236-06-2D, Bis(triphenylphosphine)iminium, metal complex 58367-01-4,  
 Glucose 66796-30-3, Nafion 117 80498-15-3, Laccase 80619-01-8,  
 Bilirubin oxidase 85452-91-1 104420-44-2  
 RL: DEV (Device component use); USES (Uses)  
 (immobilized enzymes in biocathodes)

IT 10182-91-9D, Dodecyltrimethylammonium, halide 10549-76-5D,  
 Tetrabutylammonium, halide 23079-35-8D, Triethylhexylammonium, halide  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (immobilized enzymes in biocathodes)

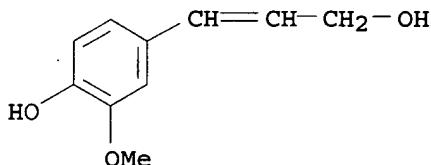
IT 598-35-6, Lactaldehyde 72909-34-3, PQQ 161201-31-6  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (immobilized enzymes in biocathodes)

IT 57-88-5, Cholesterol, uses  
 RL: DEV (Device component use); USES (Uses)  
 (oxidase based on; immobilized enzymes in biocathodes)

IT 458-35-5, Coniferyl alcohol  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (fuel; immobilized enzymes in biocathodes)

RN 458-35-5 HCAPLUS

CN Phenol, 4-(3-hydroxy-1-propenyl)-2-methoxy- (9CI) (CA INDEX NAME)



L52 ANSWER 2 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:1334537 HCAPLUS

DN 144:72245

ED Entered STN: 23 Dec 2005

TI Lead acid **battery**

IN Kozawa, Shiny; Yoshio, Masayuki; Okayasu, Tatsuya

PA Mase, Shunzo, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-12

ICS H01M004-14; H01M004-62; H01M010-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2005353559	A2	20051222	JP 2004-202491	20040611
PRAI JP 2004-202491		20040611		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2005353559	ICM	H01M010-12
	ICS	H01M004-14; H01M004-62; H01M010-08
	IPCI	H01M0010-12 [ICM, 7]; H01M0004-14 [ICS, 7]; H01M0004-62 [ICs, 7]; H01M0010-08 [ICS, 7]
	FTERM	5H028/AA06; 5H028/EE06; 5H028/HH02; 5H050/AA07; 5H050/BA09; 5H050/CA06; 5H050/CB15; 5H050/DA09; 5H050/EA23; 5H050/HA01

AB The **battery** has a container having gaps, for commuting of a dilute H<sub>2</sub>SO<sub>4</sub> based **electrolyte** or a H<sub>2</sub>SO<sub>4</sub> based **electrolyte** containing an organic **polymer**, capable of raising the H overpotential at the anode during overcharging, and is filled with an H overpotential raising organic **polymer** soluble in the **electrolyte**.

ST lead acid **battery** hydrogen overpotential raising **polymer**

IT Secondary **batteries**  
(lead acid **batteries** containing **electrolyte** soluble hydrogen overpotential raising organic **polymers**)

IT 7664-93-9, Sulfuric acid, uses  
RL: DEV (Device component use); USES (Uses)  
(lead acid **batteries** containing **electrolyte** soluble hydrogen overpotential raising organic **polymers**)

IT 9002-89-5, Poly(vinyl alcohol) 9003-01-4, Poly(acrylic acid) 9003-01-4D, Poly(acrylic acid), esters 9005-53-2, **Lignin**, uses  
RL: MOA (Modifier or additive use); USES (Uses)

(lead acid **batteries** containing **electrolyte** soluble hydrogen overpotential raising organic **polymers**)

IT 9002-89-5, Poly(vinyl alcohol) 9003-01-4, Poly(acrylic acid) 9003-01-4D, Poly(acrylic acid), esters 9005-53-2, **Lignin**, uses  
RL: MOA (Modifier or additive use); USES (Uses)

(lead acid **batteries** containing **electrolyte** soluble hydrogen overpotential raising organic **polymers**)

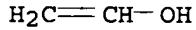
RN 9002-89-5 HCAPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

CMF C2 H4 O



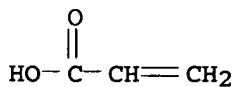
RN 9003-01-4 HCAPLUS

CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7

CMF C3 H4 O2



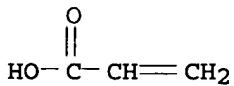
RN 9003-01-4 HCPLUS

CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7

CMF C3 H4 O2



RN 9005-53-2 HCPLUS

CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 3 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2005:732148 HCPLUS

DN 143:176321

ED Entered STN: 12 Aug 2005

TI Flat separators for polymer electrolyte fuel cells and their preparation

IN Nogami, Takashi; Shimane, Nobuhiro; Hasebe, Hiroshi; Sakuta, Toshihide

PA Shin-Etsu Polymer Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M008-02

ICS H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2005216679	A2	20050811	JP 2004-22022	20040129
PRAI JP 2004-22022		20040129		

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

JP 2005216679	ICM	H01M008-02
	ICS	H01M008-10
	IPCI	H01M008-02 [ICM,7]; H01M0008-10 [ICS,7]
	FTERM	5H026/AA06; 5H026/BB00; 5H026/BB01; 5H026/BB02; 5H026/BB06; 5H026/BB08; 5H026/CC03; 5H026/EE06; 5H026/EE18

AB The flat separators having convexes and concaves on  $\geq 1$  planes are made of mixts. of polymers and multiple elec. conductive fillers, wherein at least a part of the conductive fillers are aligned in a direction intersecting the planar direction. The separators are prepared by a process comprising steps of (1) compressive molding or extruding the

mixts. into primary sheets with aligning the conductive fillers in a direction intersecting the compression direction or in the extrusion direction, resp., (2) laminating the primary sheets to give blocks, (3) cutting the blocks into secondary sheets in a direction intersecting the alignment direction of the conductive fillers, and (4) forming the uneven pattern on the secondary sheet surfaces. The separators show improved elec. conductivity in the thickness direction than ordinarily prepared one.

ST **polymer electrolyte fuel cell separator conductive filler alignment**

IT **Fuel cell separators**

(preparation of flat separators containing **polymer** and conductive fillers for **polymer electrolyte** fuel cells)

IT **Phenolic resins, uses**

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(preparation of flat separators containing **polymer** and conductive fillers for **polymer electrolyte** fuel cells)

IT 7782-42-5, Graphite, uses 9003-35-4, Formaldehyde-phenol **copolymer**

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(separator component; preparation of flat separators containing **polymer** and conductive fillers for **polymer electrolyte** fuel cells)

L52 ANSWER 4 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2005:672235 HCPLUS

DN 143:136389

ED Entered STN: 29 Jul 2005

TI Manufacture of membrane-electrode assemblies (MEA) for fuel cells, and same fuel cells

IN Nakanishi, Harumichi; Kobayashi, Nobuyuki; Sekisawa, Yoshifumi; Takami, Masanobu; Inazumi, Kon; Fujita, Daisuke; Shiozaki, Hideki; Saira, Tomonori

PA Toyota Motor Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 24 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M008-02

ICS H01M004-86; H01M004-88; H01M004-90; H01M004-92; H01M004-96; H01M008-10

CC 52-2 (**Electrochemical, Radiational, and Thermal Energy Technology**)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005203332	A2	20050728	JP 2004-134393	20040428
PRAI	JP 2003-421240	A	20031218		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2005203332	ICM	H01M008-02	
	ICS	H01M004-86; H01M004-88; H01M004-90; H01M004-92; H01M004-96; H01M008-10	
	IPCI	H01M0008-02 [ICM,7]; H01M0004-86 [ICS,7]; H01M0004-88 [ICS,7]; H01M0004-90 [ICS,7]; H01M0004-92 [ICS,7]; H01M0004-96 [ICS,7]; H01M0008-10 [ICS,7]	
	FTERM	5H018/AA06; 5H018/BB01; 5H018/BB03; 5H018/BB05;	

5H018/BB07; 5H018/BB08; 5H018/BB13; 5H018/BB16;  
 5H018/BB17; 5H018/DD05; 5H018/DD06; 5H018/EE03;  
 5H018/EE05; 5H018/EE10; 5H018/EE12; 5H018/EE13;  
 5H018/EE18; 5H018/EE19; 5H018/HH01; 5H018/HH03;  
 5H018/HH04; 5H026/AA06; 5H026/BB03; 5H026/BB04;  
 5H026/BB10; 5H026/CX07; 5H026/EE02; 5H026/EE05;  
 5H026/EE08; 5H026/EE11; 5H026/EE19; 5H026/HH01;  
 5H026/HH03; 5H026/HH04

AB The MEA is constituted by a **polymer electrolyte** membrane, and electrode-catalyst-carrying carbon nanotubes aligned on the membrane. A proton-conductive substance (e.g., perfluorosulfonic acids) and a water-repellent material (e.g., **fluoropolymer**) may be formed on the carbon nanotubes. The carbon nanotubes may be covered with an oxygen-rich thermal insulator (ceramics). The MEA is manufactured by a process comprising steps of (1) alloying an electrode catalyst to load on carbon nanotubes, (2) transferring the carbon nanotubes on a **polymer electrolyte** membrane, and (3) allowing one end of the carbon nanotubes to join with the **electrolyte** membrane with **aligning** the carbon nanotubes. The other end of the carbon nanotubes may be bonded with a separator via an elec. conductive adhesive. The MEA achieves high power generation efficiency without fastening.

ST fuel cell membrane electrode assembly carbon nanotube

IT Nanotubes

(carbon; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT Fuel cells

(manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT **Fluoropolymers**, uses

RL: DEV (Device component use); USES (Uses)

(manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 677301-04-1, JEF 120

RL: NUU (Other use, unclassified); USES (Uses)

(elec. conductive adhesive, for bonding carbon nanotubes with separators; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 7440-06-4P, Platinum, uses

RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(electrode catalyst; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 7440-44-0P, Carbon, uses

RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)

(nanotubes; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 1306-38-3, Cerium oxide (CeO<sub>2</sub>), uses

RL: DEV (Device component use); USES (Uses)

(oxygen-rich ceramics, thermal insulators on carbon nanotubes; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 24937-79-9, Polyvinylidene fluoride 63496-24-2, Nafion EW 1100

RL: DEV (Device component use); USES (Uses)

(proton conductor coatings on carbon nanotubes; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

IT 50851-57-5P, Styrenesulfonic acid **homopolymer**

RL: DEV (Device component use); IMF (Industrial manufacture); PREP

(Preparation); USES (Uses)

(water-repellent coatings on carbon nanotubes; manufacture of membrane-electrode assemblies (MEA) containing carbon nanotubes for fuel cells)

L52 ANSWER 5 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2005:611329 HCPLUS

DN 143:100456

ED Entered STN: 15 Jul 2005

TI Polymer electrolyte fuel cells, membrane-electrode assemblies (MEA) for same fuel cells, and preparation of MEA

IN Abe, Mitsutaka

PA Nissan Motor Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M008-02

ICS H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005190750	A2	20050714	JP 2003-428616	20031225
PRAI	JP 2003-428616			20031225	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 2005190750	ICM	H01M008-02
		ICS	H01M008-10
		IPCI	H01M0008-02 [ICM,7]; H01M0008-10 [ICS,7]
		FTERM	5H026/AA06; 5H026/BB00; 5H026/BB03; 5H026/CX05; 5H026/HH02

AB The MEA comprises a proton-conductive solid polymer film, a pair of electrode catalyst layers sandwiching the polymer film, and a pair of gas-diffusing layers sandwiching the electrode catalyst layers, wherein the electrode catalyst layer is formed within a porous substance framework whose periphery is positioned at outside of the periphery of the gas-diffusing layer. Also claimed is a process for preparation of the MEA, capable of easily aligning the electrode catalyst layer. The preparation process comprises steps of (1) placing a porous substance on the polymer film, (2) impregnating the porous substance with a solution containing the electrode catalyst, the proton-conductive polymer, and a solvent, and then removing the solvent to form the electrode catalyst layer. Alternatively, the electrode catalyst layer is formed on the gas-diffusing layer. Alternatively, a substrate sheet is employed in forming the electrode catalyst layer, and then the substrate sheet is removed. The process is easy-to-align the electrode catalyst layer, and the porous substance work as a reinforcement and prevents the polymer film from damage caused by the gas-diffusing layer.

ST polymer electrolyte fuel cell membrane electrode assembly reinforcement

IT Carbon black, uses

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(electrode catalyst support; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT Fluoropolymers, uses

IT RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)  
 (polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT Fuel cells  
 (polymer electrolyte; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT Polyimides, uses  
 RL: DEV (Device component use); USES (Uses)  
 (porous reinforcement for electrode catalyst layer; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT Porous materials  
 (reinforcement for electrode catalyst layer; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT 7440-06-4, Platinum, uses  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (electrode catalyst; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT 163294-14-2, Nafion 112  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (proton-conductive solid polymer film; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

IT 9002-84-0, PTFE  
 RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)  
 (substrate for forming reinforced electrode catalyst layer; polymer electrolyte fuel cell with membrane-electrode assembly reinforced with porous substance)

L52 ANSWER 6 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:370797 HCAPLUS  
 DN 142:433082  
 ED Entered STN: 29 Apr 2005  
 TI Method for charging secondary lead-acid battery  
 IN Ozawa, Akiya; Manoyn, Creo; Wada, Mamoru; Mase, Shunzo  
 PA Japan  
 SO Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM H01M010-44  
 ICS H01M010-08  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
PI JP 2005116493	A2	20050428	JP 2003-383150	20031008
PRAI JP 2003-383150				

CLASS

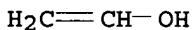
PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
-----	-----	-----
JP 2005116493	ICM H01M010-44	
	ICS H01M010-08	

IPCI H01M0010-44 [ICM,7]; H01M0010-08 [ICS,7]  
 FTERM 5H028/EE06; 5H028/FF01; 5H028/HH10; 5H030/AA00;  
 5H030/BB06

AB The method is carried out by applying a pulsed current onto a secondary lead-acid **battery**, having an **electrolyte** solution which contains polyacrylic acid, polyacrylate, polyvinyl alc., and/or fine-grain lignin.  
 ST charge method secondary lead acid **battery** pulsed current application; **battery electrolyte** soln org **polymer** additive  
 IT **Battery electrolytes**  
     (charge methods of secondary lead-acid **batteries** containing pulsed current applications and having organic **polymer** additives in **electrolyte** solns.)  
 IT Secondary **batteries**  
     (lead-acid; charge methods of secondary lead-acid **batteries** containing pulsed current applications and having organic **polymer** additives in **electrolyte** solns.)  
 IT 9002-89-5, Polyvinyl alcohol  
   RL: MOA (Modifier or additive use); USES (Uses)  
     (charge methods of secondary lead-acid **batteries** containing pulsed current applications and having organic **polymer** additives in **electrolyte** solns.)  
 IT 9002-89-5, Polyvinyl alcohol  
   RL: MOA (Modifier or additive use); USES (Uses)  
     (charge methods of secondary lead-acid **batteries** containing pulsed current applications and having organic **polymer** additives in **electrolyte** solns.)  
 RN 9002-89-5 HCPLUS  
 CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5  
 CMF C2 H4 O



L52 ANSWER 7 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:188316 HCPLUS  
 ED Entered STN: 04 Mar 2005  
 TI Ionic conduction in thin films of **polymer electrolytes**  
 AU Truong, Nguyen H.; Teeters, Dale  
 CS Department of Chemistry and Biochemistry, The University of Tulsa, Tulsa, OK, 74104, USA  
 SO Abstracts of Papers, 229th ACS National Meeting, San Diego, CA, United States, March 13-17, 2005 (2005), CHED-1188 Publisher: American Chemical Society, Washington, D. C.  
 CODEN: 69GQMP  
 DT Conference; Meeting Abstract  
 LA English  
 AB The major obstacle for the use of **polymer electrolytes** in **batteries** is the low ionic conduction of these materials. One way to attack this problem is the confinement of **polymer electrolytes**, such as poly(ethylene oxide), PEO, in nanochannels or nanopores that are ordered parallel to the direction of ion conduction. Confinement enhances ion conduction either by aligning the

polymer chains or crystallites of the polymer and/or by enhancing conduction at the interface of the channel. This work is concerned with PEO-lithium triflate electrolytes confined in micro and nanoporous, com. available filtration membranes. We have attempted to grow thin coatings or cylinders of polymer on the channel surfaces. The structure of the polymer in the channels was determined by SEM and ionic conduction has been studied by a.c. impedance techniques. Studying conduction of these structures will help to determine the importance of interfacial ionic conduction in enhanced conduction processes.

L52 ANSWER 8 OF 38 COMPENDEX COPYRIGHT 2006 EEI on STN  
 AN 2005(37):7411 COMPENDEX  
 TI A novel flow **battery** - A lead acid **battery** based on an **electrolyte** with soluble lead(II): IV. The influence of additives.  
 AU Hazza, Ahmed (School of Chemistry The University, Southampton SO171BJ, United Kingdom); Fletcher, Derek; Wills, Richard  
 SO Journal of Power Sources v 149 n SUPPL. Sep 26 2005 2005.p 103-111  
 CODEN: JPSODZ ISSN: 0378-7753  
 PY 2005  
 DT Journal  
 TC Experimental  
 LA English  
 AB During development of an undivided flow **battery** based on the Pb(II)/Pb and PbO<sub>2</sub>/Pb(II) couples in aqueous methanesulfonic acid, it was noted that **battery** performance might be improved by additives that (i) decrease the roughness of the lead deposit at the negative electrode and (ii) enhance the kinetics of the Pb(II)/PbO<sub>2</sub> couple at the positive electrode. This paper reports the study of sodium **ligninsulfonate** and polyethylene **glycol** as potential levelling agents for lead and of three inorganic ions as possible catalysts for the Pb(II)/PbO<sub>2</sub> couple. The addition of 1 g dm<sup>-3</sup> **ligninsulfonate** leads to uniform deposits without the tendency to form dendrites but leads to a slight decrease in both charge and energy efficiency for the **battery**. Only nickel(II) reduced the overpotential for PbO<sub>2</sub> deposition but again it has an adverse influence on the energy efficiency. ©CPY 2005 Elsevier B.V. All rights reserved. 17  
 Refs.  
 CC 702.1.1 Primary Batteries; 804.2 Inorganic Compounds; 803 Chemical Agents and Basic Industrial Chemicals; 704.1 Electric Components; 525.2 Energy Conservation  
 CT \*Lithium **batteries**; **Electrolytes**; Additives; Catalysts; Energy efficiency; Electrodes; Lead compounds  
 ST Flow **batteries**; Lead acid; Methanesulfonic acid  
 ET Pb; O\*Pb; O sy 2; sy 2; Pb sy 2; PbO<sub>2</sub>/Pb; Pb cp; cp; O cp; PbO

L52 ANSWER 9 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2004:964668 HCAPLUS  
 DN 141:398259  
 ED Entered STN: 12 Nov 2004  
 TI Direct methanol fuel cell electrode catalyst  
 IN Fan, Qinbai  
 PA USA  
 SO U.S. Pat. Appl. Publ., 11 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H01M004-86  
 ICS H01M004-94; B05D005-12; H01M004-88  
 INCL 429044000; 429042000; 502101000; 427115000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
Technology)  
Section cross-reference(s): 38, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004224218	A1	20041111	US 2003-642852	20030818
PRAI	US 2003-468324P	P	20030506		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US	2004224218	ICM	H01M004-86
		ICS	H01M004-94; B05D005-12; H01M004-88
		INCL	429044000; 429042000; 502101000; 427115000
		IPCI	H01M0004-86 [ICM,7]; H01M0004-94 [ICS,7]; B05D0005-12 [ICS,7]; H01M0004-88 [ICS,7]
		NCL	429/044.000

AB The invention concerns a method and device for reducing or substantially eliminating methanol crossover from the anode to the cathode of a direct methanol fuel cell and for increasing catalyst efficiency in which a catalyst ink layer comprising an electron conductive and proton conductive binder material is applied either to the anode electrode or the electrolyte layer of the direct methanol fuel cell.

ST methanol fuel cell electrode catalyst

IT Sulfonic acids, uses

RL: DEV (Device component use); USES (Uses)  
(direct methanol fuel cell electrode catalyst)

IT Catalysts

(electrocatalysts; direct methanol fuel cell electrode catalyst)

IT Polyoxyalkylenes, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(fluorine- and sulfo-containing, ionomers; direct methanol fuel cell electrode catalyst)

IT Polymers, uses

RL: DEV (Device component use); USES (Uses)  
(graft; direct methanol fuel cell electrode catalyst)

IT Fluoropolymers, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(polyoxyalkylene-, sulfo-containing, ionomers; direct methanol fuel cell electrode catalyst)

IT Ionomers

RL: MOA (Modifier or additive use); USES (Uses)  
(polyoxyalkylenes, fluorine- and sulfo-containing; direct methanol fuel cell electrode catalyst)

IT Fuel cells

(proton exchange membrane; direct methanol fuel cell electrode catalyst)

IT Sulfonic acids, uses

RL: DEV (Device component use); USES (Uses)  
(salts; direct methanol fuel cell electrode catalyst)

IT 12714-36-2, Platinum 50, ruthenium 50 atomic

RL: CAT (Catalyst use); USES (Uses)  
(direct methanol fuel cell electrode catalyst)

IT 62-53-3, Aniline, processes 109-97-7, Pyrrole 275-51-4, Azulene

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(direct methanol fuel cell electrode catalyst)

IT 7664-38-2D, Phosphoric acid, derivative 7664-93-9D, Sulfuric acid, derivative 13598-36-2, Phosphonic acid 13598-36-2D, Phosphonic acid, salt 25233-30-1, Polyaniline 30604-81-0, Polypyrrole 82451-56-7,

**Polyazulene 679809-71-3**

RL: DEV (Device component use); USES (Uses)  
 (direct methanol fuel cell electrode catalyst)

IT 67-56-1, Methanol, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (direct methanol fuel cell electrode catalyst)

IT 104-15-4, p-Toluenesulfonic acid, uses 8062-15-5,

**Lignosulfonic acid**

RL: MOA (Modifier or additive use); USES (Uses)  
 (proton conductive material; direct methanol fuel cell electrode catalyst)

IT 679809-71-3

RL: DEV (Device component use); USES (Uses)  
 (direct methanol fuel cell electrode catalyst)

RN 679809-71-3 HCPLUS

CN Lignin, polymer with benzenamine, graft (9CI) (CA INDEX NAME)

CM 1

CRN 9005-53-2

CMF Unspecified

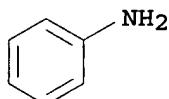
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 62-53-3

CMF C6 H7 N



IT 8062-15-5, Lignosulfonic acid

RL: MOA (Modifier or additive use); USES (Uses)  
 (proton conductive material; direct methanol fuel cell electrode catalyst)

RN 8062-15-5 HCPLUS

CN Lignosulfonic acid (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 10 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2004:331639 HCPLUS

DN 140:342205

ED Entered STN: 23 Apr 2004

TI Apparatus and method of manufacture of electrochemical cell components

IN Baars, Dirk M.; Borges, Hillary P.; Chen, Sueng B.

PA USA

SO U.S. Pat. Appl. Publ., 20 pp., Cont.-in-part of U.S. Ser. No. 53,346.

CODEN: USXXCO

DT Patent

LA English

IC ICM H01M008-04

ICS H01M002-08

INCL 429026000; 429036000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
Technology)  
Section cross-reference(s): 38, 47, 72

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004076863	A1	20040422	US 2003-638117	20030807
	US 2002155333	A1	20021024	US 2002-53346	20020118
PRAI	US 2001-262991P	P	20010119		
	US 2001-263010P	P	20010119		
	US 2002-53346	A2	20020118		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2004076863	ICM	H01M008-04	
	ICS	H01M002-08	
	INCL	429026000; 429036000	
	IPCI	H01M0008-04 [ICM, 7]; H01M0002-08 [ICS, 7]	
	NCL	429/026.000	
	ECLA	C25B009/04; H01M008/02B2; H01M008/02C; H01M008/02C2K2	
US 2002155333	IPCI	H01M0008-04 [ICM, 7]; H01M0008-02 [ICS, 7]; H01M0002-08 [ICS, 7]	
	NCL	429/026.000	
	ECLA	C25B009/04; H01M008/02B2; H01M008/02C; H01M008/02C2K2	

AB A component for an electrochem. cell comprises a thermally and elec. conductive core, wherein the conductive core comprises apertures, and wherein the conductive core further comprises an active area substantially covered by an elec. and thermally conductive **polymeric** composite. The conductive **polymeric** composite is adhered to the core by an adhesion promoter comprising elec. conductive particles to reduce the volume resistivity of the component, and an optional adhesive composition. Components may be manufactured having a volume resistivity of about 0.500 Ω-cm or less and a thermal conductivity of at least about 5 W/m ° K. In addition, the component is economical to produce due to inexpensive starting materials as well as the use of conventional processing equipment.

ST electrochem cell component fabrication app; fuel cell component fabrication app; electrolyzer cell component fabrication app

IT Glass spheres

RL: MOA (Modifier or additive use); USES (Uses)  
(Ag-coated; apparatus and method of manufacture of electrochem. cell components)

IT Conducting polymers  
(adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT Epoxy resins, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT Composites

Electric resistance

Electrochemical cells

Electrolytic cells

Fuel cells

Thermal conductivity

(apparatus and method of manufacture of electrochem. cell components)

IT Alloys, uses

Intermetallic compounds

Metals, uses

Phenolic resins, uses

Polyacetylenes, uses

Polyanilines  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (apparatus and method of manufacture of electrochem. cell components)

IT Butadiene rubber, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (of 1,2-configuration, adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT Polyimides, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (polyamide-, adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT Polyamides, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (polyimide-, adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT Adhesion, physical  
 (promoter; apparatus and method of manufacture of electrochem. cell components)

IT 80-43-3, Perkadox BC 128-37-0, Ionol, uses 3290-92-4, Sartomer SR-350  
 7291-09-0, Vinylsilane 7440-21-3D, Silicon, compound 7440-32-6D,  
 Titanium, compound 7440-47-3D, Chromium, compound 7440-67-7D, Zirconium,  
 compound 7782-42-5, Graphite, uses 7803-62-5D, Silane,  
 mercapto-functional 13598-78-2, Aminosilane 679809-71-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (adhesion promoter; apparatus and method of manufacture of electrochem. cell components)

IT 4420-74-0, A-189 7429-90-5, Aluminum, uses  
 RL: DEV (Device component use); USES (Uses)  
 (apparatus and method of manufacture of electrochem. cell components)

IT 77-99-6, Trimethylolpropane 90-72-2, Ancamine K54 131-17-9, Diallyl  
 phthalate 614-45-9 1592-23-0, Calcium stearate 7440-02-0, Nickel,  
 uses 7440-22-4, Silver, uses 7440-44-0, Carbon, uses 9003-35-4  
 25053-15-0, Poly(diallyl phthalate) 25067-58-7, Polyacetylene  
 25233-30-1, Polyaniline 25233-34-5, Polythiophene 26009-24-5,  
 Poly-p-phenylenevinylene 30604-81-0, Polypyrrole 31566-31-1, Glycerol  
 monostearate 99241-45-9, Epiclon N-770 101225-65-4, 2-Butenoic acid,  
 2,3-dimethyl-, ion(1-) 133174-08-0, Sumiepoxy ESCN 195XL 25  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (apparatus and method of manufacture of electrochem. cell components)

IT 9003-17-2  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (butadiene rubber, of 1,2-configuration, adhesion promoter; apparatus and  
 method of manufacture of electrochem. cell components)

IT 679809-71-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (adhesion promoter; apparatus and method of manufacture of electrochem. cell  
 components)

RN 679809-71-3 HCPLUS

CN Lignin, polymer with benzenamine, graft (9CI) (CA INDEX NAME)

CM 1

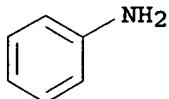
CRN 9005-53-2  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 62-53-3

CMF C6 H7 N



L52 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2004:142664 HCAPLUS  
 DN 140:149238  
 ED Entered STN: 22 Feb 2004  
 TI Lead-acid battery having an organic polymer additive  
 IN Kozawa, Akiya; Hrada, Hirofumi; Yokoi, Giyun  
 PA Japan  
 SO U.S. Pat. Appl. Publ., 10 pp., Cont.-in-part of U.S. Ser. No. 439,258.  
 CODEN: USXXCO

DT Patent  
 LA English  
 IC ICM H01M010-08  
 ICS H01M010-44

INCL 429347000; 429204000; 429205000; 429050000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)

Section cross-reference(s): 38  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004033422	A1	20040219	US 2003-634592	20030805
	JP 2002323862	A2	20021108	JP 2002-14177	20020516
	US 2003228525	A1	20031211	US 2003-439258	20030515
	JP 2004356076	A2	20041216	JP 2003-185790	20030526
	JP 2004356077	A2	20041216	JP 2003-185791	20030526
	WO 2004105161	A2	20041202	WO 2004-IB1727	20040526
	WO 2004105161	A3	20050616		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG					
PRAI	JP 2002-14177	A	20020516		
	US 2003-439258	A2	20030515		
	JP 2003-185790	A	20030526		
	JP 2003-185791	A	20030526		
	JP 2001-15418	A	20010124		
	US 2003-634592	A	20030805		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2004033422	ICM	H01M010-08
	ICS	H01M010-44
	INCL	429347000; 429204000; 429205000; 429050000

*applicant*

	IPCI	H01M0010-08 [ICM, 7]; H01M0010-44 [ICS, 7]
	NCL	429/347.000
JP 2002323862	IPCI	G09F0009-00 [ICM, 7]; B32B0007-02 [ICS, 7]; C08J0007-04 [ICS, 7]; C08J0007-06 [ICS, 7]; C23C0014-06 [ICS, 7]; C23C0014-08 [ICS, 7]; C08L0101-00 [ICS, 7]
US 2003228525	IPCI	H01M0010-08 [ICM, 7]; H01M0010-44 [ICS, 7]
	NCL	429/347.000
JP 2004356076	IPCI	H01M0010-42 [ICM, 7]; H01M0010-08 [ICS, 7]
	FTERM	5H028/AA06; 5H028/BB02; 5H028/BB03; 5H028/BB06; 5H028/BB10; 5H028/FF01; 5H028/HH02; 5H028/HH10; 5H030/AS20; 5H030/BB00; 5H030/BB18
JP 2004356077	IPCI	H01M0010-54 [ICM, 7]; C25C0001-22 [ICS, 7]
	FTERM	4K058/AA21; 4K058/BA30; 4K058/BB04; 4K058/CA04; 4K058/CA20; 4K058/EB13; 4K058/ED03; 4K058/ED04; 4K058/FC07; 4K058/FC21; 5H031/AA01; 5H031/BB09; 5H031/RR02; 5H031/RR07

WO 2004105161 IPCI H01M0002-16 [ICM, 7]

AB The invention concerns a process for prolonging the life of a lead-acid **battery** by adding an organic **polymer** and ultra fine lignin to its **electrolyte** and then discharging the **battery** at a high current rate and the **battery** so produced.

ST lead acid **battery** org **polymer** additive

IT **Battery electrolytes**

(lead-acid **battery** having organic **polymer** additive)

IT Polysiloxanes, uses

RL: MOA (Modifier or additive use); USES (Uses)

(lead-acid **battery** having organic **polymer** additive)

IT Secondary **batteries**

(lead-acid; lead-acid **battery** having organic **polymer** additive)

IT 7440-36-0, Antimony, miscellaneous

RL: MSC (Miscellaneous)

(impurity; lead-acid **battery** having organic **polymer** additive)

IT 107-21-1, Ethylene glycol, uses 7440-31-5, Tin, uses 7440-74-6, Indium, uses 7446-14-2, Lead sulfate 7727-43-7, Barium sulfate 9002-89-5, Polyvinyl alcohol 9003-01-4, Polyacrylic acid 9005-53-2, Lignin, uses

RL: MOA (Modifier or additive use); USES (Uses)

(lead-acid **battery** having organic **polymer** additive)

IT 9002-89-5, Polyvinyl alcohol 9003-01-4, Polyacrylic acid 9005-53-2, Lignin, uses

RL: MOA (Modifier or additive use); USES (Uses)

(lead-acid **battery** having organic **polymer** additive)

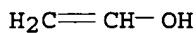
RN 9002-89-5 HCPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

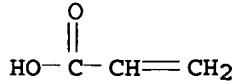
CMF C2 H4 O



RN 9003-01-4 HCPLUS

CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7  
CMF C3 H4 O2RN 9005-53-2 HCAPLUS  
CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 12 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:634143 HCAPLUS  
 DN 139:166974  
 ED Entered STN: 15 Aug 2003  
 TI Polymer electrolyte membrane fuel cell system  
 including contaminant removal method  
 IN George, Paul E.; Saunders, James H.; Vijayendran, Bhima  
 PA Battelle Memorial Institute, USA  
 SO PCT Int. Appl., 69 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H01M008-04  
 ICS H01M008-10  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003067695	A2	20030814	WO 2003-US3864	20030206
	WO 2003067695	A3	20031127		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2003210939	A1	20030902	AU 2003-210939	20030206
	US 2005069735	A1	20050331	US 2004-913293	20040806
PRAI	US 2002-354770P	P	20020206		
	WO 2003-US3864	W	20030206		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003067695	ICM	H01M008-04	
	ICS	H01M008-10	
	IPCI	H01M0008-04 [ICM, 7]; H01M0008-10 [ICS, 7]	
AU 2003210939	IPCI	H01M0008-04 [ICM, 7]; H01M0008-10 [ICS, 7]	
US 2005069735	IPCI	H01M0008-00 [ICM, 7]; H01M0008-10 [ICS, 7]	

NCL 429/013.000

AB The invention relates to a fuel cell system comprising: a fuel processor for producing hydrogen from a fuel; and a fuel cell stack including a plurality of **polymer electrolyte** membranes and a plurality of electrodes; where the **polymer electrolyte** membrane comprises a proton conducting hydrocarbon-based **polymer** membrane, the **polymer** having a backbone and having acidic groups on side chains attached to the backbone. The invention also relates to methods of removing contaminants from the fuel cell electrode.

ST **polymer electrolyte** membrane fuel cell system contaminant removal method

IT Reforming apparatus  
(fuel; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Oligomers  
RL: TEM (Technical or engineered material use); USES (Uses)  
(hydrocarbon-based; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Polyketones  
Polysulfones, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polyether-, sulfonated; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Polyethers, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polyketone-, sulfonated; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Algorithm  
Fuel cell **electrolytes**  
(**polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT **Polymer** blends  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(**polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Hydrocarbons, uses  
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(**polymers**; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Polyethers, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polysulfone-, sulfonated; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Fuel gas manufacturing  
(reforming; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Fuel cells  
(solid **electrolyte**; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT Polyoxyalkylenes, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(sulfonated; **polymer electrolyte** membrane fuel cell system including contaminant removal method)

IT 630-08-0, Carbon monoxide, miscellaneous

RL: MSC (Miscellaneous)  
 (impurity; **polymer electrolyte** membrane fuel cell  
 system including contaminant removal method)

IT 8062-15-5DP, **Lignosulfonate**, sulfonated 25322-69-4DP,  
**Polypropylene oxide**, sulfonated

RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (**polymer electrolyte** membrane fuel cell system  
 including contaminant removal method)

IT 127-19-5, Dimethyl acetamide 288-32-4, Imidazole, uses 872-50-4,  
 n-Methylpyrrolidone, uses 10294-54-9, Cesium sulfate 12067-99-1,  
 Phosphotungstic acid

RL: MOA (Modifier or additive use); USES (Uses)  
 (**polymer electrolyte** membrane fuel cell system  
 including contaminant removal method)

IT 1333-74-0P, Hydrogen, uses

RL: SPN (Synthetic preparation); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (**polymer electrolyte** membrane fuel cell system  
 including contaminant removal method)

IT 8062-15-5DP, **Lignosulfonate**, sulfonated

RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (**polymer electrolyte** membrane fuel cell system  
 including contaminant removal method)

RN 8062-15-5 HCAPLUS

CN Lignosulfonic acid (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 13 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:634139 HCAPLUS  
 DN 139:166971  
 ED Entered STN: 15 Aug 2003  
 TI **Polymer electrolyte** membranes for use in fuel cells  
 IN Vijayendran, Bhima; McGinniss, Vincent D.; Risser, Steven M.; Schulte,  
 Michael D.; Sayre, Jay R.; Cafmeyer, Jeffrey T.  
 PA Battelle Memorial Institute, USA  
 SO PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H01M008-02  
 CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003067691	A2	20030814	WO 2003-US3862	20030206
	WO 2003067691	A3	20031016		
				W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF,	

BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  
 CA 2475501 AA 20030814 CA 2003-2475501 20030206  
 AU 2003209080 A1 20030902 AU 2003-209080 20030206  
 EP 1474839 A2 20041110 EP 2003-707808 20030206  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK  
 JP 2005531646 T2 20051020 JP 2003-566925 20030206  
 US 2005069745 A1 20050331 US 2004-912590 20040805  
 PRAI US 2002-354717P P 20020206  
 WO 2003-US3862 W 20030206

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003067691	ICM	H01M008-02
	IPCI	H01M0008-02 [ICM, 7]
	ECLA	B01D069/14B; B01D071/46; B01D071/52; B01D071/68; B01D071/82; H01M008/10E2
CA 2475501	IPCI	H01M0008-02 [ICM, 7]
	ECLA	B01D069/14B; B01D071/46; B01D071/52; B01D071/68; B01D071/82; H01M008/10E2
AU 2003209080	IPCI	H01M0008-02 [ICM, 7]
EP 1474839	IPCI	H01M0008-02 [ICM, 7]
	ECLA	B01D069/14B; B01D071/46; B01D071/52; B01D071/68; B01D071/82; H01M008/10E2
JP 2005531646	IPCI	C08J0005-22 [ICM, 7]; H01B0001-06 [ICS, 7]; H01B0013-00 [ICS, 7]; H01M0008-02 [ICS, 7]; H01M0008-10 [ICS, 7]; C08L0101-00 [ICS, 7]
	FTERM	4F071/AA04; 4F071/AA51; 4F071/AA61; 4F071/AA64; 4F071/AA86; 4F071/AF36; 4F071/AH15; 4F071/BC01; 4F071/FA05; 4F071/FB01; 4F071/FC02; 4F071/FD03; 4F071/FD04; 5G301/CA30; 5G301/CD01; 5G301/CE01; 5H026/AA08; 5H026/BB00; 5H026/BB08; 5H026/EE18
US 2005069745	IPCI	H01M0008-10 [ICM, 7]; C08J0005-22 [ICS, 7]
	NCL	429/033.000

AB This invention relates to a **polymer electrolyte** membrane comprising a proton conducting hydrocarbon-based **polymer** membrane, the **polymer** having a backbone and having acidic groups on side chains attached to the backbone. The invention also relates to a **polymer electrolyte** membrane comprising a proton conducting hydrocarbon-based **polymer** membrane having a phase separated morphol. microstructure. The invention also relates to a **polymer electrolyte** membrane comprising a proton conducting membrane, the membrane comprising a basic material in combination with an acidic material selected from acidic hydrocarbon-based **polymers**, acidic hydrocarbon-based oligomers, and blends thereof.

ST **Polymer electrolyte** membrane fuel cell use

IT Polymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (aromatic, sulfonated; **polymer electrolyte** membranes  
 for use in fuel cells)

IT Epoxy resins, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (aromatic; **polymer electrolyte** membranes for use in  
 fuel cells)

IT Fuel cells

(direct methanol; **polymer electrolyte** membranes for  
 use in fuel cells)

IT Polyoxyalkylenes, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
 (fluorine- and sulfo-containing, ionomers; **polymer**

electrolyte membranes for use in fuel cells)

IT Oligomers  
RL: TEM (Technical or engineered material use); USES (Uses)  
(hydrocarbon-based; **polymer electrolyte** membranes  
for use in fuel cells)

IT Polymers, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(inorg., sulfonated; **polymer electrolyte** membranes  
for use in fuel cells)

IT Cyclosiloxanes  
RL: TEM (Technical or engineered material use); USES (Uses)  
(pentaglycidyl ethers, Siloxirane; **polymer electrolyte**  
membranes for use in fuel cells)

IT Polysulfones, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
(Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polyether-, sulfonated; **polymer electrolyte**  
membranes for use in fuel cells)

IT Polyketones  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(polyether-, sulfonated; **polymer electrolyte**  
membranes for use in fuel cells)

IT Polyethers, uses  
RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(polyketone-, sulfonated; **polymer electrolyte**  
membranes for use in fuel cells)

IT Fuel cell electrolytes  
Glass transition temperature  
Ionic conductivity  
(**polymer electrolyte** membranes for use in fuel  
cells)

IT Polymer blends  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**polymer electrolyte** membranes for use in fuel  
cells)

IT Alicyclic compounds  
RL: TEM (Technical or engineered material use); USES (Uses)  
(polymers. sulfonated; **polymer electrolyte**  
membranes for use in fuel cells)

IT Hydrocarbons, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(polymers; **polymer electrolyte** membranes  
for use in fuel cells)

IT Fluoropolymers, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(polyoxyalkylene-, sulfo-containing, ionomers; **polymer electrolyte**  
membranes for use in fuel cells)

IT Ionomers  
RL: TEM (Technical or engineered material use); USES (Uses)  
(polyoxyalkylenes, fluorine- and sulfo-containing; **polymer electrolyte**  
membranes for use in fuel cells)

IT Polyethers, uses  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM  
(Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polysulfone-, sulfonated; **polymer electrolyte**  
membranes for use in fuel cells)

IT Fuel cells  
(solid **electrolyte**; **polymer electrolyte**)

membranes for use in fuel cells)

IT **Polymers, uses**

RL: TEM (Technical or engineered material use); USES (Uses)  
(sulfonated, organic hybrid; **polymer electrolyte**  
membranes for use in fuel cells)

IT **Polyoxyphenylenes**

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(sulfonated; **polymer electrolyte** membranes for use  
in fuel cells)

IT 127-19-5, Dimethyl acetamide 872-50-4, n-Methylpyrrolidone, uses

10294-54-9, Cesium sulfate 12067-99-1, Phosphotungstic acid

RL: MOA (Modifier or additive use); USES (Uses)  
(**polymer electrolyte** membranes for use in fuel  
cells)

IT 67-56-1, Methanol, uses 288-32-4, Imidazole, uses 288-32-4D,  
Imidazole, substituted 584-08-7, Potassium carbonate 7447-41-8,  
Lithium chloride (LiCl), uses 7647-14-5, Sodium chloride, uses  
7778-80-5, Potassium sulfate, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(**polymer electrolyte** membranes for use in fuel  
cells)

IT **8062-15-5, Lignosulfonate**

RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(resins, sulfonated; **polymer electrolyte** membranes  
for use in fuel cells)

IT **8062-15-5, Lignosulfonate**

RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)  
(resins, sulfonated; **polymer electrolyte** membranes  
for use in fuel cells)

RN 8062-15-5 HCPLUS

CN Lignosulfonic acid (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 14 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2003:398337 HCPLUS

DN 138:404288

ED Entered STN: 25 May 2003

TI Lead storage **battery** and indium additive therefor for prevention  
of capacity decline

IN Ikeda, Shoichiro; Kozawa, Akiya; Yoshio, Masaki

PA Tagawa, Kazuo, Japan; Kozawa, Akiya

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-08

ICS H01M004-62

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy  
Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 2003151618	A2	20030523	JP 2001-382340	20011109
PRAI JP 2001-382340			20011109	

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

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JP 2003151618 ICM H01M010-08  
 ICS H01M004-62  
 IPCI H01M0010-08 [ICM,7]; H01M0004-62 [ICS,7]

AB The Pb storage **battery** contains In 1-1,000 ppm in the **electrolyte** and/or the **electrodes**. The additive further include PVA 0.01-5, PEG 0.01-2, PMA 0.01-0.5 and/or **lignin** 0.01-2%.

ST lead storage **battery** indium additive

IT Secondary **batteries**  
 (Lead storage **battery** and indium additive therefor for prevention of capacity decline)

IT Polyoxyalkylenes, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (Lead storage **battery** and indium additive therefor for prevention of capacity decline)

IT 13464-82-9, Indium sulfate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (Lead storage **battery** and indium additive therefor for prevention of capacity decline)

IT 9002-89-5, PVA 9005-53-2, Lignin, uses  
 25322-68-3, PEG 78565-16-9, PMA  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (Lead storage **battery** and indium additive therefor for prevention of capacity decline)

IT 9002-89-5, PVA 9005-53-2, Lignin, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (Lead storage **battery** and indium additive therefor for prevention of capacity decline)

RN 9002-89-5 HCPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5  
 CMF C2 H4 OH2C=CH-OHRN 9005-53-2 HCPLUS  
 CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 15 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1  
 AN 2003:799369 HCPLUS  
 DN 140:131003  
 ED Entered STN: 13 Oct 2003  
 TI Beneficial action of complex organic **polymer** additions for the regeneration of deteriorated lead acid **batteries**  
 AU Sugawara, M.; Tachibana, K.; Kozawa, A.; Yamashita, M.; Ikeda, S.; Brodd, R. J.  
 CS Faculty of Engineering, Yamagata University, Japan  
 SO ITE Letters on Batteries, New Technologies & Medicine (2003), 4(4), 424-431  
 CODEN: ILBMF9; ISSN: 1531-2046  
 PB ITE-Hohwa Inc.  
 DT Journal  
 LA English

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

AB Complex organic polymers with, or without, carbon additives were found to be very effective in reactivating deteriorated lead acid batteries. The beneficial effects of the polymers, reported in this paper, were confirmed by measuring the electrochem. effects sep. on both the anode and cathode in car batteries and in expts. with pure lead electrodes. The beneficial effects of the additives are found to reside on the anode and not the cathode. In the presence of the additive, the lead sulfate, PbSO<sub>4</sub>, crystals formed on the anode were found to be finer and more active.

ST polymer additive electrolyte lead acid battery regeneration

IT Battery electrolytes Passivation  
(beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT Acrylic polymers, uses  
Polymers, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte additives; beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT Secondary batteries  
(lead-acid; beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT Vinyl compounds, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(polymers, electrolyte additives; beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT 7446-14-2, Lead sulfate  
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)  
(beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT 132036-01-2, Sulfuric acid, antimony salt  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT 8068-05-1, Lignin, alkali 9002-89-5, Polyvinyl alcohol 10031-62-6, Tin sulfate 13464-82-9, Indium sulfate  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte additives; beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

IT 7440-44-0, Carbon, uses  
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(ultrafine powders, electrolyte additives; beneficial action of complex organic polymer addns. for regeneration of deteriorated lead acid batteries)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Kozawa, A; US 5958623 1999 HCPLUS  
 (2) Kozawa, A; Japanese Patent Pending  
 (3) Kozawa, A; Kagaku Kogyo 2002, V53, P872 HCPLUS  
 (4) Mori, Y; ITE Letters, in press V4(4)  
 (5) Nishina, T; ITE Letters, in press V4(4) HCPLUS  
 IT 8068-05-1, Lignin, alkali 9002-89-5, Polyvinyl  
 alcohol  
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material  
 use); USES (Uses)  
 (electrolyte additives; beneficial action of complex organic  
 polymer addns. for regeneration of deteriorated lead acid  
 batteries)

RN 8068-05-1 HCPLUS

CN Lignin, alkali (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 9002-89-5 HCPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

CMF C2 H4 O

$$\text{H}_2\text{C}=\text{CH}-\text{OH}$$

L52 ANSWER 16 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:676348 HCPLUS  
 DN 137:203989  
 ED Entered STN: 08 Sep 2002  
 TI Method for producing membrane electrode assembly for use in fuel cell  
 power generation using oxygen and hydrogen  
 IN Hong, Byung-Sun; Kim, Ho-Suk; Shin, Mi-Nam  
 PA Fuelcellpower Co., Ltd., S. Korea  
 SO PCT Int. Appl., 83 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H01M  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38, 72

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002069413	A2	20020906	WO 2002-KR284	20020222
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	KR 2002069338	A	20020830	KR 2001-50734	20010822
	US 2003114297	A1	20030619	US 2002-221720	20020912

US 2005238800	A1	20051027	US 2005-170850	20050630
PRAI KR 2001-9533	A	20010224		
KR 2001-50734	A	20010822		
WO 2002-KR284	W	20020222		
US 2002-221720	A3	20020912		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002069413	ICM	H01M
	IPCI	H01M [ICM, 7]
KR 2002069338	IPCI	H01M0008-02 [ICM, 7]
US 2003114297	IPCI	B01J0031-00 [ICM, 7]
	NCL	502/159.000
US 2005238800	IPCI	H01M0008-10 [ICM, 7]
	NCL	427/115.000
	ECLA	H01M008/10B; H01M008/10B2

AB The present invention relates to a membrane electrode assembly (MEA) which significantly enhances power d. as well as structural reliability and method for producing the same. More specially, it relates to the membrane electrode assembly which has a plurality of protuberances and method for producing the same. The present invention involves making supporting bodies to have a plurality of protuberances on one side of the supporting bodies, forming a catalyst layer on one side of the supporting bodies having the protuberances, interposing a **polymer-electrolyte-membrane** between the supporting bodies, aligning the supporting bodies for the protuberances to engage each other; and hot-pressing the aligned supporting bodies. The present invention can increase area of three-phase boundary in which oxidation-reduction reaction of hydrogen and oxygen occurs and decrease resistance to ion conduction; consequently fuel cells have the characteristic of a large output of power d.

ST fuel cell membrane electrode assembly

IT Catalysts

(electrocatalysts; method for producing membrane electrode assembly for use in fuel cell power generation using oxygen and hydrogen)

IT Power

(generation; method for producing membrane electrode assembly for use in fuel cell power generation using oxygen and hydrogen)

IT Fuel cells

Membranes, nonbiological

**Polymer electrolytes**

Spraying

(method for producing membrane electrode assembly for use in fuel cell power generation using oxygen and hydrogen)

IT 7782-44-7, Oxygen, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(method for producing membrane electrode assembly for use in fuel cell power generation using oxygen and hydrogen)

IT 1333-74-0, Hydrogen, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(method for producing membrane electrode assembly for use in fuel cell power generation using oxygen and hydrogen)

L52 ANSWER 17 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:816310 HCAPLUS

DN 135:360204

ED Entered STN: 09 Nov 2001

TI Lead acid **battery** and its additive

IN Ikeda, Shoichiro; Yamashita, Masamichi; Ozawa, Akiya

PA Mase, Shunzo, Japan; Tagawa, Kazuo  
 SO Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM H01M010-08  
 ICS H01M004-14; H01M004-62  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)

## FAN.CNT 1

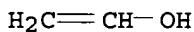
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001313064	A2	20011109	JP 2000-169775	20000428
PRAI	JP 2000-169775			20000428	

## CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 2001313064	ICM	H01M010-08
		ICS	H01M004-14; H01M004-62
		IPCI	H01M0010-08 [ICM,7]; H01M0004-14 [ICS,7]; H01M0004-62 [ICS,7]

AB The **battery** contains poly(acrylic acid) or its esters, and optionally poly(vinyl alc.) in its **electrolyte** solution and/or anode active mass mixture. The additive includes poly(acrylic acid) or its esters, and may also contain poly(vinyl alc.), soluble lignin, SnSO<sub>4</sub>, Sn(SO<sub>4</sub>)<sub>2</sub>, and/or colloidal PbSO<sub>4</sub>.  
 ST lead **battery electrolyte** anode additive polyacrylic acid; polyacrylate ester lead **battery** additive  
 IT Secondary **batteries**  
 (lead-acid; poly(acrylic acid) and polyacrylate ester based additives in **electrolytes** and anodes for lead acid **batteries**)  
 IT 7446-14-2, Lead sulfate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (colloidal; poly(acrylic acid) and polyacrylate ester based additives in **electrolytes** and anodes for lead acid **batteries**)  
 IT 7488-55-3, Stannous sulfate 9002-89-5, Poly(vinyl alcohol)  
 9003-01-4, Poly(acrylic acid) 9003-01-4D, Poly(acrylic acid), esters 9005-53-2, Lignin, uses 19307-28-9, Stannic sulfate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (poly(acrylic acid) and polyacrylate ester based additives in **electrolytes** and anodes for lead acid **batteries**)  
 IT 9002-89-5, Poly(vinyl alcohol) 9003-01-4, Poly(acrylic acid) 9003-01-4D, Poly(acrylic acid), esters 9005-53-2, Lignin, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (poly(acrylic acid) and polyacrylate ester based additives in **electrolytes** and anodes for lead acid **batteries**)  
 RN 9002-89-5 HCAPLUS  
 CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

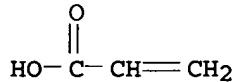
CM 1

CRN 557-75-5  
CMF C2 H4 O

RN 9003-01-4 HCPLUS  
 CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

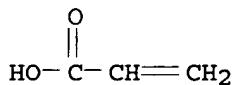
CRN 79-10-7  
 CMF C3 H4 O2



RN 9003-01-4 HCPLUS  
 CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7  
 CMF C3 H4 O2



RN 9005-53-2 HCPLUS  
 CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 18 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2001:796615 HCPLUS  
 DN 135:346875  
 ED Entered STN: 02 Nov 2001  
 TI Sealed lead acid batteries  
 IN Nakayama, Takuo; Yoshimura, Tsunesuke; Sasaki, Takehiro  
 PA Matsushita Electric Industrial Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM H01M010-06  
 ICS H01M002-02; H01M004-62  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001307761	A2	20011102	JP 2000-117475	20000419
PRAI JP 2000-117475				

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2001307761	ICM	H01M010-06
	ICS	H01M002-02; H01M004-62
	IPCI	H01M0010-06 [ICM,7]; H01M0002-02 [ICS,7]; H01M0004-62 [ICS,7]

AB The batteries have a polymer case, an electrode-separator stack in the case, and an electrolyte retained in the stack; where the anode active mass contains 2.1-5.0% BaSO<sub>4</sub>, and the battery case is (modified) poly(phenylene ether). The anode active mass may also contain 0.15-0.7% Na lignosulfonate

ST sealed lead battery anode barium sulfonate; sodium lignosulfonate lead battery anode; polyphenylene ether sealed lead battery case

IT **Battery anodes**  
(anodes containing barium sulfate and sodium lignosulfonate for sealed lead acid batteries with (modified) poly(phenylene ether) cases)

IT **Secondary batteries**  
(lead-acid; anodes containing barium sulfate and sodium lignosulfonate for sealed lead acid batteries with (modified) poly(phenylene ether) cases)

IT 7439-92-1, Lead, uses 9041-80-9, Poly(phenylene ether) 25805-30-5  
RL: DEV (Device component use); USES (Uses)  
(anodes containing barium sulfate and sodium lignosulfonate for sealed lead acid batteries with (modified) poly(phenylene ether) cases)

IT 7727-43-7, Barium sulfate 8061-51-6, Sodium lignosulfonate  
RL: MOA (Modifier or additive use); USES (Uses)  
(anodes containing barium sulfate and sodium lignosulfonate for sealed lead acid batteries with (modified) poly(phenylene ether) cases)

IT **8061-51-6, Sodium lignosulfonate**  
RL: MOA (Modifier or additive use); USES (Uses)  
(anodes containing barium sulfate and sodium lignosulfonate for sealed lead acid batteries with (modified) poly(phenylene ether) cases)

RN 8061-51-6 HCAPLUS  
CN Lignosulfonic acid, sodium salt (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 19 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 2002:912261 HCAPLUS  
DN 139:71463  
ED Entered STN: 02 Dec 2002  
TI Thermal stability studies of Li-ion cell negative electrode materials: graphite, MCMB, hard-carbon and InSb  
AU Maleki, Hossein; Howard, Jason N.  
CS Motorola Inc./Energy Systems Group, Lawrenceville, GA, 30043-6913, USA  
SO Carbon'01, An International Conference on Carbon, Lexington, KY, United States, July 14-19, 2001 (2001), 1244-1249 Publisher: University of Kentucky Center for Applied Energy Research Library, Lexington, Ky.  
CODEN: 69DHNI; ISBN: 0-9674971-2-4  
DT Conference; (computer optical disk)  
LA English  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
AB Anodes for Li-ion batteries are typically made by casting a mixture of carbon with poly(vinylidene difluoride) (PVDF) onto copper current collectors. Differential scanning calorimetry anal. showed that the total exothermic heat generation of lithiated synthetic graphite, mesocarbon microbeads (MCMB), lignin-based hard carbon, or mixts. of these materials increased with increasing lithiation. This heat

generation was attributed to the reaction of PVDF with  $\text{Li}_{x}\text{C}_6$ . Differences in the thermal stability of these anode materials were observed. InSb material exhibited exothermic reaction even as raw material or as freshly coated electrodes. The heat generation of this material increased with increasing lithiation, cycling, or addition of electrolyte.

Partial or complete substitution of PVDF with a phenol-formaldehyde binder reduced the heat generation from the PVDF reaction with  $\text{Li}_{x}\text{C}_6$ .

ST graphite anode thermal stability; mesocarbon microbead anode thermal stability; carbon hard anode thermal stability; indium antimonide anode thermal stability; anode thermal stability lithium ion **battery**; polyvinylidene difluoride carbon anode lithium ion **battery**

IT **Fluoropolymers**, uses

RL: DEV (Device component use); USES (Uses)  
(thermal stability study of anode materials of graphite, mesocarbon microbeads, hard carbon, and indium antimonide containing poly(vinylidene difluoride) binder for lithium-ion **batteries**)

IT **Battery anodes**

(thermal stability study of anode materials of graphite, mesocarbon microbeads, hard carbon, and indium antimonide for lithium-ion **batteries**)

IT 24937-79-9, Poly(vinylidene difluoride)

RL: DEV (Device component use); USES (Uses)  
(thermal stability study of anode materials of graphite, mesocarbon microbeads, hard carbon, and indium antimonide containing poly(vinylidene difluoride) binder for lithium-ion **batteries**)

IT 1312-41-0, Indium antimonide 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)  
(thermal stability study of anode materials of graphite, mesocarbon microbeads, hard carbon, and indium antimonide for lithium-ion **batteries**)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Du Pasquier, A; J Electrochem Soc 1998, V145, P472
- (2) Gray, F; Solid Polymer Electrolytes-Fundamental and Technological Applications 1991
- (3) Kanamura, K; J Electroanal Chem 1995, V394, P49 HCPLUS
- (4) Maleki, H; J Electrochem Soc 1998, V145, P721 HCPLUS
- (5) Maleki, H; J Electrochem Soc 2000, V174, P4470
- (6) Menachem, C; Electrochemical Soc and International Soc of Electrochemistry Meeting Abstract 1997, V97-2
- (7) Richard, M; J Electrochem Soc 1999, V146, P2069
- (8) Vanghey, T; Electrochem and Solid-State Letter 2000, V3(1), P13

L52 ANSWER 20 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2000:68665 HCPLUS

DN 132:80997

ED Entered STN: 28 Jan 2000

TI Fabrication of lithium secondary **battery**

IN Hikmet, Rifat A. M.

PA Koninklijke Philips Electronics N.V., Neth.

SO PCT Int. Appl., 23 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM H01M010-12

ICS H01M002-18; H01M006-12; H01M010-04; H01M002-02

CC 52-2 (**Electrochemical, Radiational, and Thermal Energy Technology**)

Section cross-reference(s): 38

## FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000004601	A1	20000127	WO 1999-EP4716	19990702
	W: JP				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1038329	A1	20000927	EP 1999-932835	19990702
	EP 1038329	B1	20020206	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI	
	AT 213098	E	20020215	AT 1999-932835	19990702
	JP 2002520803	T2	20020709	JP 2000-560628	19990702
	ES 2172340	T3	20020916	ES 1999-932835	19990702
	US 6432576	B1	20020813	US 1999-352314	19990712
	HK 1032853	A1	20021025	HK 2001-102100	20010323
PRAI	EP 1998-202387	A	19980716		
	WO 1999-EP4716	W	19990702		

## CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	WO 2000004601	ICM	H01M010-12
		ICS	H01M002-18; H01M006-12; H01M010-04; H01M002-02
		IPCI	H01M0010-12 [ICM,7]; H01M0002-18 [ICS,7]; H01M0006-12 [ICS,7]; H01M0010-04 [ICS,7]; H01M0002-02 [ICS,7]
		ECLA	H01M002/02B4; H01M010/04F
	EP 1038329	IPCI	H01M0010-12 [ICM,6]; H01M0002-18 [ICS,6]; H01M0006-12 [ICS,6]; H01M0010-04 [ICS,6]; H01M0002-02 [ICS,6]
	AT 213098	IPCI	H01M0010-12 [ICM,7]; H01M0002-18 [ICS,7]; H01M0006-12 [ICS,7]; H01M0010-04 [ICS,7]; H01M0002-02 [ICS,7]
	JP 2002520803	IPCI	H01M0010-40 [ICM,7]; H01M0002-18 [ICS,7]; H01M0004-70 [ICS,7]
	ES 2172340	IPCI	H01M0010-12 [ICM,7]; H01M0002-18 [ICS,7]; H01M0006-12 [ICS,7]; H01M0010-04 [ICS,7]; H01M0002-02 [ICS,7]
	US 6432576	IPCI	H01M0002-00 [ICM,7]; H01M0002-18 [ICS,7]
		NCL	429/162.000; 429/127.000; 429/237.000
		ECLA	H01M002/02B4; H01M010/04F
	HK 1032853	IPCI	H01M [ICM,7]

AB According to one of the methods of fabrication of a thin flexible lithium-ion **battery**, an anode, a separator, and a cathode are provided with a pattern of macroscopic holes. After aligning the holes, the stack of the electrodes and the separator is placed on a structured **polymer** film having piles in the same pattern as the holes. After applying heat and pressure, the ends of the piles are flattened, and form a kind of rivets by which the electrodes and the separator are bonded together. This bonding ensures a good contact between the electrodes and an **electrolyte** in the separator.

ST lithium secondary **battery** fabrication

IT Carbon black, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(fabrication of lithium secondary **battery**)

IT **Fluoropolymers**, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(fabrication of lithium secondary **battery**)

IT Styrene-butadiene rubber, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(fabrication of lithium secondary **battery**)

IT **Secondary batteries**

(lithium; fabrication of lithium secondary **battery**)

IT Adhesives

(polymer; fabrication of lithium secondary battery)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methylcarbonate 7782-42-5, Graphite, uses 9002-88-4, Polyethylene 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (fabrication of lithium secondary battery)

IT 9002-84-0, Ptfe 9004-32-4, Carboxymethyl cellulose  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (fabrication of lithium secondary battery)

IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses  
 RL: DEV (Device component use); USES (Uses)  
 (grid; fabrication of lithium secondary battery)

IT 9003-55-8  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (styrene-butadiene rubber, fabrication of lithium secondary battery)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Aoki, T; JP 59148280 A 1984
- (2) Courtecuisse, J; FR 917676 A 1947
- (3) Francis, M; US 5518836 A 1996 HCPLUS
- (4) Julio, A; US 4996128 A 1991 HCPLUS
- (5) Koninkl Philips Electronics Nv; EP 0893838 A 1999 HCPLUS
- (6) Takeshi, M; US 5019468 A 1991
- (7) Yuasa Battery Co Ltd; EP 0614237 A 1994 HCPLUS

L52 ANSWER 21 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2

AN 2000:847097 HCPLUS

DN 134:88689

ED Entered STN: 05 Dec 2000

TI Thermal stability studies of binder materials in anodes for lithium-ion batteries

AU Maleki, Hossein; Deng, Guoping; Kerzhner-Haller, Inna; Anani, Anaba; Howard, Jason N.

CS Motorola Energy Systems Group, Lawrenceville, GA, 30043-6913, USA

SO Journal of the Electrochemical Society (2000), 147(12), 4470-4475  
 CODEN: JESOAN; ISSN: 0013-4651

PB Electrochemical Society

DT Journal

LA English

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

AB Section cross-reference(s): 57

The neg. electrode (NE) for lithium-ion batteries is conventionally made by casting a mixture of various carbon materials with polyvinylidene difluoride (PVDF) onto copper foil. Differential scanning calorimetry and accelerating rate calorimetry were used to evaluate the thermal stability of several lithiated NE materials: synthetic graphite (SFG-44), mesocarbon microbeads (MCMB), lignin-based hard carbon (HC), and mixts. of these materials. The exothermic heat generation of lithiated NES, in the absence of the electrolyte, is attributed to the reaction of PVDF with lithiated carbon (LixC6). For all samples here, the total exothermic heat generation increases with an increase in lithiation content. The onset temperature for the thermal reaction of PVDF with SFG-44 or MCMB does not depend on the lithiation content. However, this onset temperature decreases as lithiation increases in HC electrodes. These differences are attributed to structural differences between highly graphitic SFG-44 and MCMB compared with the far less graphitic HC. Total heat generation increases with PVDF binder content. An alternative resin-based binder, phenol-formaldehyde phenolic-resin (C7H6O)n, is

proposed. Full or partial substitution of this material for PVDF lowers the exothermic heat of reaction of the binder agent with lithiated NE materials.

ST thermal stability binder anode lithium **battery**; polyvinylidene difluoride binder carbon anode **battery**

IT **Battery** anodes

Binders

Thermal decomposition

(thermal stability studies of binder materials in anodes for lithium-ion **batteries**)

IT **Fluoropolymers**, uses

RL: NUU (Other use, unclassified); USES (Uses)

(thermal stability studies of binder materials in anodes for lithium-ion **batteries**)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)

(thermal stability studies of binder materials in anodes for lithium-ion **batteries**)

IT 24937-79-9, Polyvinylidene difluoride

RL: NUU (Other use, unclassified); USES (Uses)

(thermal stability studies of binder materials in anodes for lithium-ion **batteries**)

RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Arthur, D; Accelerating Rate Calorimetry (ARC) manual 1998
- (2) Aurbach, D; J Electrochem Soc 1994, V141, P603 HCAPLUS
- (3) Aurbach, D; J Electrochem Soc 1995, V142, P2882 HCAPLUS
- (4) Aurbach, D; The Electrochemical Society Proceeding Series 1997, PV 97-18, P941
- (5) Cho, J; J Electrochm Soc 2000, V147, P15 HCAPLUS
- (6) Dahn, J; Solid State Ionics 1994, V69, P265 HCAPLUS
- (7) Denton, F; US 5843393 1998 HCAPLUS
- (8) Du Pasquier, A; J Electrochem Soc 1998, V145, P472
- (9) Fong, R; J Electrochem Soc 1990, V137, P2009 HCAPLUS
- (10) Gao, Y; Electrochem Solid-State Lett 1998, V1, P117 HCAPLUS
- (11) Gray, F; Solid Polymer Electrolytes-Fundamental and Technological Applications 1991
- (12) Han, Y; J Electrochem Soc 1999, V146, P3999 HCAPLUS
- (13) Ishiakawa, M; 35th Battery Symposium Extended Abstracts 1994, V14-16, P49
- (14) Jenkins, G; Polymeric Carbon-Carbon Fiber, Glass and Char 1976
- (15) Kanamura, K; J Electroanal Chem 1995, V394, P49 HCAPLUS
- (16) Kanamura, K; J Electrochem Soc 1990, V137, P2009
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 P165

L52 ANSWER 22 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1999:723302 HCAPLUS  
 DN 131:312498  
 ED Entered STN: 12 Nov 1999  
 TI Carbon based electrodes for reduction of sulfur or oxygen  
 IN Calver, Timothy James; Male, Stewart Ernest; Mitchell, Philip John; Whyte, Ian  
 PA National Power PLC, UK  
 SO PCT Int. Appl., 24 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H01M004-96  
 ICS H01M008-18  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38, 72

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9957775	A1	19991111	WO 1999-GB1396	19990505
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	GB 2337150	A1	19991110	GB 1998-9773	19980507
	GB 2337150	B2	20000927		
	CA 2332051	AA	19991111	CA 1999-2332051	19990505
	AU 9937226	A1	19991123	AU 1999-37226	19990505
	AU 759108	B2	20030403		
	BR 9910266	A	20010109	BR 1999-10266	19990505
	EP 1084518	A1	20010321	EP 1999-919438	19990505
	EP 1084518	B1	20020724		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2002513995	T2	20020514	JP 2000-547666	19990505
	AT 221256	E	20020815	AT 1999-919438	19990505
	PT 1084518	T	20021129	PT 1999-919438	19990505
	ES 2178432	T3	20021216	ES 1999-919438	19990505
	NZ 507971	A	20030228	NZ 1999-507971	19990505
	TW 520406	B	20030211	TW 1999-88112085	19990716
	ZA 2000006223	A	20020201	ZA 2000-6223	20001101
	NO 2000005583	A	20001106	NO 2000-5583	20001106
	BG 104920	A	20010831	BG 2000-104920	20001107
	US 6511767	B1	20030128	US 2001-674847	20010524
PRAI	GB 1998-9773	A	19980507		
	WO 1999-GB1396	W	19990505		

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

WO 9957775	ICM	H01M004-96
	ICS	H01M008-18
	IPCI	H01M0004-96 [ICM,6]; H01M0008-18 [ICS,6]
	ECLA	H01M004/96; H01M008/18C4
GB 2337150	IPCI	H01M0004-96 [ICM,6]; C25B0011-12 [ICS,6]; H01M0002-38 [ICS,6]; H01M0010-36 [ICS,6]
	ECLA	H01M004/96; H01M008/18C4
CA 2332051	IPCI	H01M0004-96 [ICM,6]; H01M0008-18 [ICS,6]
AU 9937226	IPCI	H01M0004-96 [ICM,6]; H01M0008-18 [ICS,6]
BR 9910266	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
EP 1084518	IPCI	H01M0004-96 [ICM,6]; H01M0008-18 [ICS,6]
JP 2002513995	IPCI	H01M0004-96 [ICM,7]; H01M0004-96 [ICS,7]; H01M0004-88 [ICS,7]; H01M0012-08 [ICS,7]
AT 221256	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
PT 1084518	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
ES 2178432	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
NZ 507971	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
TW 520406	IPCI	C25B0011-12 [ICM,7]
ZA 2000006223	IPCI	H01M [ICM,7]
NO 2000005583	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
BG 104920	IPCI	H01M0004-96 [ICM,7]; H01M0008-18 [ICS,7]
US 6511767	IPCI	H01M0004-96 [ICM,7]; H01M0004-88 [ICS,7]
	NCL	429/042.000; 429/044.000; 502/101.000
	ECLA	H01M004/96; H01M008/18C4

AB A carbon based electrode for the electrochem. reduction of sulfur or oxygen, which comprises an electrode core and, in elec. contact therewith, a structure comprising a porous particulate activated carbon bonded with a **polymeric** binder material, characterized in that the structure is at least 1 mm thick, in that the particulate activated carbon is prepared from a **lignocellulosic** material. The material has the following properties: (i) a particle size in the range of from 200 to 850 <mm>; (ii) a pore volume of from 0.45 to 1.0 cm<sup>3</sup> per g; and (iii) a surface area in the range of from 800 to 1500 m<sup>2</sup>/g. The binder is used in an amount not exceeding 25% by weight based upon the mixture of activated carbon and binder material.

ST carbon based electrode redn sulfur oxygen; redox **battery** carbon based electrode

IT **Fluoropolymers**, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(binder; carbon based electrodes for reduction of sulfur or oxygen)

IT Reduction, electrochemical

(carbon based electrodes for reduction of sulfur or oxygen)

IT Carbon black, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(carbon based electrodes for reduction of sulfur or oxygen)

IT Polysulfides

RL: RCT (Reactant); RACT (Reactant or reagent)  
(carbon based electrodes for reduction of sulfur or oxygen)

IT Fibers

RL: DEV (Device component use); USES (Uses)  
(**lignocellulosic**, carbonized; carbon based electrodes for reduction of sulfur or oxygen)

IT Secondary batteries

(redox-flow; carbon based electrodes for reduction of sulfur or oxygen)

IT 7440-44-0, Activated carbon, uses

RL: DEV (Device component use); USES (Uses)  
(activated; carbon based electrodes for reduction of sulfur or oxygen)

IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene 24937-79-9

RL: TEM (Technical or engineered material use); USES (Uses)  
(binder; carbon based electrodes for reduction of sulfur or oxygen)

IT 7782-42-5, Graphite, uses  
 RL: DEV (Device component use); USES (Uses)  
 (carbon based electrodes for reduction of sulfur or oxygen)  
 IT 7704-34-9, Sulfur, reactions 7782-44-7, Oxygen, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (carbon based electrodes for reduction of sulfur or oxygen)  
 IT 7647-15-6, Sodium bromide, uses  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte containing Br and; carbon based electrodes for reduction  
 of sulfur or oxygen)  
 IT 7726-95-6, Bromine, uses  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte containing NaBr and; carbon based electrodes for  
 reduction of sulfur or oxygen)  
 IT 12034-39-8, Sodium sulfide na2s4  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte; carbon based electrodes for reduction of sulfur or  
 oxygen)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L52 ANSWER 23 OF 38 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2000:363588 HCPLUS

DN 132:336895

ED Entered STN: 01 Jun 2000

TI High specific energy lead acid batteries for electric vehicles

IN Chen, Youxiao; Hu, Yong; Hu, Fengxiang

PA Taiji Energy Co., Ltd., Peop. Rep. China

SO Faming Zhanli Shengqing Gongkai Shuomingshu, 9 pp.

CODEN: CNXXEV

DT Patent

LA Chinese

IC ICM H01M010-06

ICS H01M004-68; H01M004-36; H01M004-14

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 1221991	A	19990707	CN 1997-119880	19971231
PRAI CN 1997-119880			19971231	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 1221991	ICM	H01M010-06
	ICS	H01M004-68; H01M004-36; H01M004-14
	IPCI	H01M0010-06 [ICM,6]; H01M0004-68 [ICS,6]; H01M0004-36 [ICS,6]; H01M0004-14 [ICS,6]

AB The batteries use cathodes having a Pb powder based active mass  
 mixture containing H<sub>2</sub>SO<sub>4</sub> (d. 1.25), PTFE 0.01-2, graphite 0.01-0.5, and K<sub>2</sub>SO<sub>4</sub>  
 0.001-0.05% applied on grids composed of Pb-(0.01-1.2) Sb or Bi-(0.01-2.0)  
 As or Na-(0.01-1.0) Cu or Al-(0.01-2.0) Sn-(0.01-1.0)% Ag, Ce, or La

alloys; and anodes having a Pb powder based active mass mixture containing H<sub>2</sub>SO<sub>4</sub> (D. 1.25), BaSO<sub>4</sub> 0.1-0.3, Na **lignosulfonate** 0.1-0.3,  $\alpha$ - and  $\beta$ -naphthoic acid 0.1-0.3 and Diffusing Agent No 0.01-0.1% applied on grids composed of Pb-(0.02-0.12) Ca-(0.01-0.8) Sn-(0.01-0.05) Al-(0.01-0.05)% Ce alloys; and a H<sub>2</sub>SO<sub>4</sub> (d 1.285) **electrolyte** solution containing 0.1-2 volume% H<sub>3</sub>PO<sub>4</sub> and 10-100 mg K<sub>2</sub>SO<sub>4</sub>/L.

ST elec vehicle maintenance free lead acid **battery**

IT **Fluoropolymers**, uses  
RL: DEV (Device component use); USES (Uses)  
(compns. of active mass mixture and grid alloys for high specific energy lead acid **batteries** for elec. vehicles)

IT **Battery electrolytes**  
(**electrolytes** containing phosphoric acid and potassium sulfate for high specific energy lead acid **batteries** for elec. vehicles)

IT 86-55-5, 1-Naphthoic acid 93-09-4, 2-Naphthoic acid 7439-92-1, Lead, uses 7727-43-7, Barium sulfate 7757-82-6, Sodium sulfate, uses 9002-84-0, Polytetrafluoroethylene 267665-72-5 267665-73-6  
RL: DEV (Device component use); USES (Uses)  
(compns. of active mass mixture and grid alloys for high specific energy lead acid **batteries** for elec. vehicles)

IT 7664-93-9, Sulfuric acid, uses  
RL: DEV (Device component use); USES (Uses)  
(**electrolytes** containing phosphoric acid and potassium sulfate for high specific energy lead acid **batteries** for elec. vehicles)

IT 7664-38-2, Phosphoric acid, uses 7778-80-5, Potassium sulfate, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolytes** containing phosphoric acid and potassium sulfate for high specific energy lead acid **batteries** for elec. vehicles)

L52 ANSWER 24 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 3  
AN 1997:173980 HCAPLUS  
DN 126:214351  
ED Entered STN: 14 Mar 1997  
TI Role of **lignin** on depressing of anomalous growth of Pb negative electrode during charge-discharge cycling  
AU Taguchi, Masami; Hirasawa, Tokiyoshi  
CS Dep. Materials Eng., Akita Univ., Akita, 010, Japan  
SO Nippon Kinzoku Gakkaishi (1997), 61(1), 77-82  
CODEN: NIKGAV; ISSN: 0021-4876  
PB Nippon Kinzoku Gakkai  
DT Journal  
LA Japanese  
CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)  
AB The neg. electrode in the lead-acid **battery** contains a spongy Pb as the active material and a natural **polymer**, **lignin**. During repeated charge-discharge cycling in a sulfuric acid solution without **lignin**, an anomalous growth of acicular precipitate is observed on the neg. electrode. The growth is depressed by addition of lignin to the electrolyte. AES and XPS of the electrode after charge-discharge cycling show that the surface is made up of PbSO<sub>4</sub> single phase in the **lignin**-containing **electrolyte**, whereas the formation of metallic Pb occurs in the **electrolyte** without **lignin**. The **lignin** has both a water-repellent carbon chain and several water-acid functional groups., such as sulfonic acid. It absorbs the neg. electrode; the carbon chain is directed at the surface to be coated. The adsorbate depresses the redeposition of metallic Pb from Pb<sup>2+</sup> ions on the

surface which can take place locally as a side reaction in charging. Consequently, the depressing of the anomalous growth can be explained by the hindrance to the redeposition.

ST lead deposition inhibition lead acid **battery**; **lignin**  
lead deposition depressing **battery** anode

IT **Secondary batteries**  
(lead-acid; **lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT **Battery electrolytes**  
(**lignin** additive; **lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT **Battery anodes**  
(porous lead-lignin; **lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT 9005-53-2, **Lignin**, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(**lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT 7446-14-2, Lead sulfate  
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)  
(**lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT 7439-92-1, Lead, uses  
RL: DEV (Device component use); USES (Uses)  
(porous, anodes; **lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

IT 9005-53-2, **Lignin**, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(**lignin** for depressing anomalous growth of lead anode during charge-discharge cycling)

RN 9005-53-2 HCAPLUS  
CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 25 OF 38 JAPIO (C) 2006 JPO on STN  
AN 1995-296844 JAPIO  
TI LEAD-ACID **BATTERY**  
IN SASAKI MASAAKI; ARAKAWA MASAHIRO; HORII TORU; MURATA KAZUO  
PA YUASA CORP  
PI JP 07296844 A 19951110 Heisei  
AI JP 1994-88227 (JP06088227 Heisei) 19940426  
PRAI JP 1994-88227 19940426  
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995  
IC ICM H01M010-06  
ICS H01M010-08  
AB PURPOSE: To reduce the amount by which the capacity of a negative plate decreases as a lead-acid **battery** is used in cycles by installing a slowly releasing body containing a shrink-proofing agent inside a **battery** jar.  
CONSTITUTION: A shrink proofing agent composed of a **lignin** compound which is 0.2 parts by mass in 100 parts by mass of lead powder is added to the active material of the negative plate 3 of a lead-acid **battery**. A microporous film composed mainly of **polyvinyl** chloride with an average micropore diameter of 0.1 $\mu$ m and a thickness of 0.2mm is used as a slowly releasing body 5, and the shrink proofing agent composed of the **lignin** compound is wrapped in the microporous

film as if in a bag by 0.05 mass % of the electrolyte. When the battery is in use the shrink proofing agent is gradually eluted from the surface of the slowly releasing body 5 and dissolves into the electrolyte 9. The shrink proofing agent compensates for the functional degradation of the shrink proofing agent in the anode active material, thus enhancing the life of the negative plate 3.

COPYRIGHT: (C)1995,JPO

L52 ANSWER 26 OF 38 JAPIO (C) 2006 JPO on STN  
 AN 1995-220737 JAPIO  
 TI THIN TYPE BATTERY AND MANUFACTURE THEREOF  
 IN KAGAWA HIROSHI; KATO SHIRO  
 PA YUASA CORP  
 PI JP 07220737 A 19950818 Heisei  
 AI JP 1994-8228 (JP06008228 Heisei) 19940128  
 PRAI JP 1994-8228 19940128  
 SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995  
 IC ICM H01M006-18  
 ICS H01M006-12; H01M006-16  
 AB PURPOSE: To supply a thin type battery arbitrarily separated of various electric capacity by arranging an active material and an electrolyte, between flat plate- shaped positive/negative electrode collectors having the same slit holes or the like, partitioned into a fixed pattern by an electric insulating adhesive material.  
 CONSTITUTION: In a negative pole collector 6, sprocket holes 7, slit holes 8 and terminal holes 9 are provided in a fixed pattern in both end regions. After a negative pole active material 10 is arranged in a region surrounded by the holes 8, 9, in a range a little larger than this region, a high polymer solid electrolyte 11 is print hardened, and on top of this in a little smaller region, a positive electrode active material 12 is arranged and electron beam hardened. A positive electrode collector 13, obtaining the same shape to the collector 6 when inverted, and an adhesive material 14 as an electric insulating material are bonded by aligning each sprocket hole 7 with a heat die roll of fixing a roll space. By fusing a connection part 15 of the hole 8 in each partition boundary part by laser, an individual thin type battery can be obtained.  
 COPYRIGHT: (C)1995,JPO

L52 ANSWER 27 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1990:594884 HCAPLUS  
 DN 113:194884  
 ED Entered STN: 23 Nov 1990  
 TI Ionic semiconductive materials and their applications  
 IN Peck, Robert Lester  
 PA T and G Corp., USA  
 SO Eur. Pat. Appl., 32 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H01L029-28  
 ICS H01M002-16; C25B013-08; B01D069-00  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38, 76  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 370149	A2	19900530	EP 1988-312035	19881219
	EP 370149	A3	19921125		

EP 370149	B1	19960626		
R: BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
CA 1309802	A1	19921103	CA 1988-586314	19881219
AU 8827066	A1	19900531	AU 1988-27066	19881220
AU 614565	B2	19910905		
JP 02152166	A2	19900612	JP 1989-2665	19890109
PRAI US 1988-275977	A	19881125		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 370149	ICM	H01L029-28
	ICS	H01M002-16; C25B013-08; B01D069-00
	IPCI	H01L0029-28 [ICM,5]; H01M0002-16 [ICS,5]; C25B0013-08 [ICS,5]; B01D0069-00 [ICS,5]
	ECLA	A61K007/40; A61L026/00H7; B01D069/14B; C25B001/10; C25B013/08; H01M002/16C3; H01M004/02; H01M004/62B; H01M004/86; H01M006/24; H01M008/08; H01M008/18C4; H01M010/20; H01M012/06
CA 1309802	IPCI	H01L0029-28 [ICM,5]; H01M0002-16 [ICS,5]; C25B0013-08 [ICS,5]; B01D0069-00 [ICS,5]
AU 8827066	IPCI	B01D0013-00 [ICM,4]; B01J0013-02 [ICS,4]; H01M0002-16 [ICS,4]; H01M0006-02 [ICS,4]; H01M0004-76 [ICS,4]
JP 02152166	IPCI	H01M0006-18 [ICM,5]; C08L0033-00 [ICS,5]; H01B0001-12 [ICS,5]; H01M0002-16 [ICS,5]; C08L0003-00 [ICA,5]; C08L0061-04 [ICA,5]; C08L0071-02 [ICA,5]

AB The materials, having ionic conductivity strongly depending on temperature, comprise a **polymeric matrix**, .apprx.10-50 weight% dispersed **polymer** of H<sub>2</sub>O-absorbing and bonding long-chain mols., and a coupling agent for facilitating bonding between the dispersed **polymer** and matrix. The matrix is selected from poly(vinylidene chloride), PVC, poly(vinylidene fluoride), polyethylene, polypropylene, polyurethane, ethylene-vinyl acetate **copolymer**, and PhOH-HCHO **polymer**; the dispersed **polymer** is selected from PEO, poly(acrylic acid), polyacrylamide, hydroxyethyl cellulose, gelatin, pectin, cellulose and starch; and the coupling agent is selected from poly(acrylic acid), phenolic resin, cellulosic titanate, C, lignin, and SiO<sub>2</sub>. **Batteries** use these materials as separators and in their electrodes, the weight ratio of the semiconductor material:electrode material is .apprx.1.0-1.5. The ionic semiconductive materials are prepared by mixing and forming into a required shape. When inserted between H<sub>2</sub>SO<sub>4</sub> and CuSO<sub>4</sub> **electrolytes**, a p.d. is established across the materials and the current attributable to Cu<sup>2+</sup> diffusion is ≤16%.

ST **battery separator ionic semiconductive polymer;**  
**electrode battery ionic semiconductive polymer**

IT Carbon black, uses and miscellaneous  
 Phenolic resins, uses and miscellaneous

RL: USES (Uses)  
 (ionic semiconductive materials containing coupling agents of, for **battery electrodes and separators**)

IT Gelatins, uses and miscellaneous  
 RL: USES (Uses)

(ionic semiconductive materials containing dispersed, for **battery electrodes and separators**)

IT Urethane **polymers**, uses and miscellaneous  
 RL: PRP (Properties)

(ionic semiconductive materials containing matrix of, for **battery electrodes and separators**)

IT **Batteries**, secondary  
 (ionic semiconductive materials for)

IT Electrodes

(battery, ionic semiconductive materials for)

IT 9002-88-4  
 RL: USES (Uses)  
 (activated carbon-filled, ionic semiconductive materials containing matrix of, for **battery** electrodes and separators)

IT 7631-86-9, Silica, uses and miscellaneous 9005-53-2,  
 Lignin, uses and miscellaneous 103850-22-2, LICA 12  
 107666-69-3, Plexar 100  
 RL: USES (Uses)  
 (ionic semiconductive materials containing coupling agents of, for **battery** electrodes and separators)

IT 9000-69-5, Pectin 9003-01-4D, Poly(acrylic acid), crosslinked  
 9003-05-8, Polyacrylamide 9004-34-6, Cellulose, uses and miscellaneous  
 9004-62-0, Hydroxyethyl cellulose 9005-25-8, Starch, uses and  
 miscellaneous 9007-16-3, Carbomer 934 25322-68-3 120993-97-7, SGP  
 147  
 RL: USES (Uses)  
 (ionic semiconductive materials containing dispersed, for **battery** electrodes and separators)

IT 9002-85-1, Saran 864 9002-86-2, VC-54 9002-88-4, Polyethylene  
 9003-07-0D, Polypropene, maleated 9003-35-4 24937-78-8 24937-79-9,  
 Poly(vinylidene fluoride) 83271-61-8, Polypropene  
 RL: PRP (Properties)  
 (ionic semiconductive materials containing matrix of, for **battery** electrodes and separators)

IT 9005-53-2, Lignin, uses and miscellaneous  
 RL: USES (Uses)  
 (ionic semiconductive materials containing coupling agents of, for **battery** electrodes and separators)

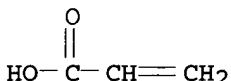
RN 9005-53-2 HCPLUS  
 CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 9003-01-4D, Poly(acrylic acid), crosslinked 9004-62-0,  
 Hydroxyethyl cellulose  
 RL: USES (Uses)  
 (ionic semiconductive materials containing dispersed, for **battery** electrodes and separators)

RN 9003-01-4 HCPLUS  
 CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7  
 CMF C3 H4 O2

RN 9004-62-0 HCPLUS  
 CN Cellulose, 2-hydroxyethyl ether (8CI, 9CI) (CA INDEX NAME)

CM 1

CRN 9004-34-6  
 CMF Unspecified  
 CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 107-21-1  
CMF C2 H6 O2HO—CH<sub>2</sub>—CH<sub>2</sub>—OH

L52 ANSWER 28 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1989:234635 HCAPLUS  
 DN 110:234635  
 ED Entered STN: 25 Jun 1989  
 TI Ionic semiconductor materials and their applications  
 IN Peck, Robert L.  
 PA T and G. Corp., USA  
 SO U.S., 16 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 IC ICM C25B013-00  
 INCL 204296000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38, 61, 72, 76

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4797190	A	19890110	US 1986-915994	19861006
	US 5055171	A	19911008	US 1990-542304	19900622
	US 5211827	A	19930518	US 1991-740061	19910805
PRAI	US 1986-915994	A2	19861006		
	US 1988-275977	B2	19881125		
	US 1990-542304	A3	19900622		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 4797190	ICM	C25B013-00
		INCL	204296000
		IPCI	C25B0013-00 [ICM, 4]
		NCL	204/296.000; 429/033.000; 429/301.000; 429/303.000
	US 5055171	IPCI	C25B0011-04 [ICM, 5]
		NCL	204/290.050; 204/290.060; 204/290.070; 204/290.110; 204/291.000
	US 5211827	IPCI	C25B0013-08 [ICM, 5]
		NCL	204/252.000; 204/296.000; 524/502.000; 524/507.000; 524/510.000; 524/520.000; 524/521.000; 524/522.000

AB The materials having a temperature-dependent ion-transport rate comprise an inert man-made **polymeric** matrix and a hydrogel. The mols. of the hydrogel are substantially uniformly dispersed in the matrix to form a composite structure where the contact between hydrogel mols. is minimized by the matrix and the formation of channels is limited, the composite allowing the transfer of ions and preventing the passage of unionized matter. The hydrogel comprises .apprx.10-50 weight% of the dry composite, and the bonding between the hydrogel mols. and the matrix is sufficient to prevent their leach-out from the composite. The matrix is selected from

poly(vinylidene chloride), PVC, poly(vinylidene fluoride), polyethylene, polypropylene, polyurethane, and PhOH-HCHO resin. The hydrogel is selected from polyethylene oxide, poly(acrylic acid) and polyacrylamide or devised from hydroxyethyl cellulose, gelatin, pectin, cellulose, and starch. When the composite seps. H<sub>2</sub>SO<sub>4</sub> and CuSO<sub>4</sub> electrolytes and a p.d. is applied across the composite, the current attributable to Cu<sup>2+</sup> diffusion is ≤16% of the equilibrium current. The composite materials may be used in batteries and fuel cells, for water purification, as solid polymeric electrolytes, in breathable waterproof coatings, and in numerous other applications for controlled moisture or ion transfer. Various applications of different materials are reported. A Zn-MnO<sub>2</sub> dry-cell battery with a separator constructed from 30% polyethylene oxide and 70% poly(vinylidene chloride) delivered a current equal to that of a conventional battery, and could be repeatably deeply discharged and charged, limited only by irregular replating of the Zn.

ST semiconductor ionic polymer hydrogel; fuel cell ionic semiconductor; battery ionic semiconductor; coating waterproof ionic semiconductor; water purifn ionic semiconductor; polyethylene oxide polyvinylidene chloride battery; zinc battery separator ionic semiconductor; manganese dioxide zinc battery separator

IT Phenolic resins, uses and miscellaneous

RL: USES (Uses)  
(coupling agents, membranes containing, hydrogel-polymer, ionically conductive, for electrochem. and electrolytic cells)

IT Urethane polymers, uses and miscellaneous

RL: USES (Uses)  
(membranes containing hydrogel and, ionically conductive, for electrochem. and electrolytic cells)

IT Coupling agents

(membranes containing, hydrogel-polymer, ionically conductive, for electrochem. and electrolytic cells)

IT Gelatins, uses and miscellaneous

RL: USES (Uses)  
(membranes of polymers and silica-containing, ionically conductive, for electrochem. and electrolytic cells)

IT Electric resistance

(of hydrogel-polymer matrix composite membranes)

IT Electrodes

(battery, encapsulated with hydrogel-polymer matrix composite)

IT Carbon fibers, uses and miscellaneous

RL: USES (Uses)  
(graphite, membranes containing, hydrogel-polymer, ionically conductive, for electrochem. and electrolytic cells, Fortafil 3)

IT Gels

(hydro-, membranes containing polymer and, ionically conductive, for electrochem. and electrolytic cells)

IT Batteries, secondary

(separators, hydrogel-polymer matrix)

IT 7440-66-6, Zinc, uses and miscellaneous

RL: USES (Uses)  
(anodes, encapsulated with hydrogel-polymer matrix composite, for batteries)

IT 7440-44-0 7782-42-5

RL: USES (Uses)  
(carbon fibers, graphite, membranes containing, hydrogel-polymer,

ionically conductive, for electrochem. and **electrolytic** cells, Fortafil 3)

IT 60676-86-0  
RL: USES (Uses)  
(catholyte, containing carbon, in electrochem. and **electrolytic** cells containing ionically conductive hydrogel-**polymer** membrane separators)

IT 9005-53-2, Lignin, uses and miscellaneous 103850-22-2,  
LICA 12  
RL: USES (Uses)  
(coupling agent, membranes containing, hydrogel-**polymer**, ionically conductive, for electrochem. and **electrolytic** cells)

IT 7440-32-6D, Titanium, neoalkoxy complexes  
RL: USES (Uses)  
(coupling agents, membranes containing, hydrogel-**polymer**, ionically conductive, for electrochem. and **electrolytic** cells, LICA 12)

IT 11113-88-5, Silver oxide  
RL: USES (Uses)  
(electrodes, encapsulated with hydrogel-**polymer** matrix composite, for **batteries**)

IT 9002-85-1, Poly(vinylidene chloride) 9002-86-2, Poly(vinyl chloride)  
9003-07-0, Polypropylene 9003-35-4, Formaldehyde-phenol **polymer**  
24937-79-9, Poly(vinylidene fluoride) 120993-93-3, RAP 184  
RL: USES (Uses)  
(membranes containing hydrogel and, ionically conductive, for electrochem. and **electrolytic** cells)

IT 9000-69-5, Pectin 9003-01-4, Poly(acrylic acid) 9003-05-8  
9004-34-6, Cellulose, uses and miscellaneous 9004-62-0,  
Hydroxyethyl cellulose 9005-25-8, Starch, uses and miscellaneous  
25322-68-3 120993-97-7, SGP 147  
RL: USES (Uses)  
(membranes containing **polymer** and, ionically conductive, for electrochem. and **electrolytic** cells)

IT 9005-25-8D, Starch, derivs.  
RL: USES (Uses)  
(membranes containing **polymer** and, ionically conductive, for electrochem. and **electrolytic** cells, SGP 147)

IT 7440-44-0, Carbon, uses and miscellaneous  
RL: USES (Uses)  
(membranes containing powdered, hydrogel-**polymer**, ionically conductive, for electrochem. and **electrolytic** cells)

IT 8061-51-6, Lignosol FTA 8062-15-5D,  
Lignosulfonic acid, salts 24937-78-8D, maleated 107666-69-3,  
Plexar 100  
RL: USES (Uses)  
(membranes containing, hydrogel-**polymer**, ionically conductive, for electrochem. and **electrolytic** cells)

IT 9005-53-2, Lignin, uses and miscellaneous  
RL: USES (Uses)  
(coupling agent, membranes containing, hydrogel-**polymer**, ionically conductive, for electrochem. and **electrolytic** cells)

RN 9005-53-2 HCAPLUS  
CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 9003-01-4, Poly(acrylic acid) 9004-62-0, Hydroxyethyl cellulose

## RL: USES (Uses)

(membranes containing polymer and, ionically conductive, for electrochem. and electrolytic cells)

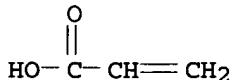
RN 9003-01-4 HCAPLUS

CN 2-Propenoic acid, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 79-10-7

CMF C3 H4 O2



RN 9004-62-0 HCAPLUS

CN Cellulose, 2-hydroxyethyl ether (8CI, 9CI) (CA INDEX NAME)

CM 1

CRN 9004-34-6

CMF Unspecified

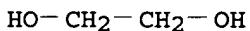
CCI PMS, MAN

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2

CRN 107-21-1

CMF C2 H6 O2



IT 8061-51-6, Lignosol FTA 8062-15-5D,

Lignosulfonic acid, salts

## RL: USES (Uses)

(membranes containing, hydrogel-polymer, ionically conductive, for electrochem. and electrolytic cells)

RN 8061-51-6 HCAPLUS

CN Lignosulfonic acid, sodium salt (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 8062-15-5 HCAPLUS

CN Lignosulfonic acid (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L52 ANSWER 29 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1984:54607 HCAPLUS

DN 100:54607

ED Entered STN: 12 May 1984

TI Poly(vinyl alcohol) battery separator containing inert filler

IN Sheibley, Dean W.; Hsu, Li Chen; Manzo, Michelle A.

PA United States National Aeronautics and Space Administration, USA

SO U. S. Pat. Appl., 14 pp. Avail. NTIS Order No. PAT-APPL-6-463 440.

CODEN: XAXXAV

DT Patent  
 LA English  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38, 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 463440	A0	19831125	US 1983-463440	19830203
PRAI US 1983-463440		19830203		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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AB A particulate filler, inert to alkaline **battery electrolyte**, is incorporated in the separator in an amount of 1-20% based on the weight of the poly(vinyl alc.) (PVA) [9002-89-5], and is dispersed throughout the product. Incorporation of the filler enhances performance and increases cycle life of alkaline **batteries**. Suitable fillers include titanates, silicates, zirconates, aluminates, wood flour, lignin, and TiO<sub>2</sub>. Particle size is .1torsi<sub>m</sub>.50 $\mu$ . Thus, crosslinked PVA separators incorporated with Ca-Zr silicate and TiO<sub>2</sub> were prepared. For a Ni-Zn **battery** with the separator, load voltages at different discharge rates were higher, and better capacity was attained from crosslinked PVA film with fillers than from PVA film without fillers. Resistivity of the film improved significantly with the addition of fillers as did the Zn dendrite penetration rate. Zincate diffusivity value improved somewhat with filler addition

ST nickel zinc **battery** separator; polyvinyl alc titania **battery** separator; calcium zirconium silicate **battery** separator

IT Clays, uses and miscellaneous

RL: USES (Uses)

(**battery** separators from crosslinked poly(vinyl alc.) containing, manufacture and properties of nickel-zinc)

IT Electric resistance

(of crosslinked poly(vinyl alc.) containing inert filler, for **battery** separators)

IT Wood

(flour, **battery** separators from crosslinked poly(vinyl alc.) containing, manufacture and properties of)

IT Batteries, secondary

(separators, nickel-zinc, crosslinked poly(vinyl alc.) with inert filler, manufacture and properties of)

IT 1344-95-2D, solid solns. with zirconium silicate 10101-52-7D, solid solns. with calcium silicate 12060-00-3D, solid solns. with lead zirconate 12060-01-4D, solid solns. with lead titanate 13463-67-7, uses and miscellaneous

RL: USES (Uses)

(**battery** separators from crosslinked poly(vinyl alc.) containing, manufacture and properties of nickel-zinc)

IT 9002-89-5P

RL: PREP (Preparation)

(crosslinked, **battery** separators from inert filler-containing, manufacture and properties of nickel-zinc)

IT 9002-89-5P

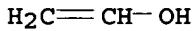
RL: PREP (Preparation)

(crosslinked, **battery** separators from inert filler-containing, manufacture and properties of nickel-zinc)

RN 9002-89-5 HCPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5  
CMF C2 H4 O

L52 ANSWER 30 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1982:165660 HCAPLUS  
 DN 96:165660  
 ED Entered STN: 12 May 1984  
 TI Poly(vinyl alcohol) **battery** separator containing an inert filler  
 IN Sheibley, Dean W.; Hsu, Li Chen; Manzo, Michelle A.  
 PA United States National Aeronautics and Space Administration, USA  
 SO U. S. Pat. Appl., 14 pp.  
 CODEN: XAXXAV

DT Patent

LA English

CC 52-2 (**Electrochemical, Radiational, and Thermal Energy Technology**)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 272233	A0	19811204	US 1981-272233	19810610
PRAI	US 1981-272233		19810610		

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

AB A filler (insol. titanates, silicates, zirconates, aluminates, wood flour, lignin [9005-53-2], and TiO<sub>2</sub>) of particle size <50 $\mu$  and inert to an alkaline **battery** **electrolyte** is incorporated in and dispersed through the **battery** separator. Thus, Ni-Zn **batteries** with filler-containing crosslinked poly(vinyl alc.) [9002-89-5] film separators showed higher load voltages at different discharge rates and attained better cell capacity than **batteries** with separators without fillers.

ST nickel zinc **battery** separator filler; titania **battery** separator filler; silicate **battery** separator filler; zirconate **battery** separator filler; aluminate **battery** separator filler; lignin **battery** separator filler; wood flour **battery** separator filler; polyvinyl alc **battery** separator

IT **Batteries**, secondary (separators, alkaline nickel-zinc, fillers-containing, crosslinked poly(vinyl alc.))

IT 9005-53-2, uses and miscellaneous 13463-67-7, uses and miscellaneous

RL: USES (Uses)

(batteries from crosslinked poly(vinyl alc.) containing, alkaline nickel-zinc)

IT 9002-89-5

RL: USES (Uses)

(crosslinked, **battery** separators, filler-containing alkaline nickel-zinc)

IT 9005-53-2, uses and miscellaneous

RL: USES (Uses)

(battery separators from crosslinked poly(vinyl alc.) containing, alkaline nickel-zinc)

RN 9005-53-2 HCAPLUS

CN Lignin (8CI, 9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 9002-89-5

RL: USES (Uses)

(crosslinked, **battery** separators, filler-containing alkaline nickel-zinc)

RN 9002-89-5 HCAPLUS

CN Ethenol, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 557-75-5

CMF C2 H4 O

H2C=CH-OH

L52 ANSWER 31 OF 38 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1975:608339 HCAPLUS

DN 83:208339

ED Entered STN: 12 May 1984

TI Sealed nickel-zinc storage **battery**

IN Sekido, Satoshi; Ohhira, Tsukasa; Yokoyama, Takao; Ikeda, Yutaka

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

INCL 57C2; 57C21

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 50009725	A2	19750131	JP 1973-61661	19730531
PRAI JP 1973-61661	A	19730531		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 50009725	INCL	57C2; 57C21
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AB Sealed Ni-Zn storage **batteries** are obtained by (1) placing a Ni [7440-02-0] cathode in contact with a Ni or Ni-plated vessel, (2) filling the vessel with an **electrolyte** consisting of 4-6M KOH or a mixture of KOH and LiOH, and (3) using a catalytic gas electrode. These **batteries** have a long service life, high energy d., and a low self-discharging tendency. Thus, a **battery** was constructed using a sintered Ni cathode which was placed in contact with the inner walls of a Ni vessel. A Ni lead was spot welded to the Ni container. The anode was a Zn [7440-66-6]-paste electrode prepared by applying a paste consisting of ZnO [1314-13-2] powder to which was added Ca(OH)<sub>2</sub> [1305-62-0] 1.0 and Na ligninsulfonate 0.05% blended with aqueous poly(vinyl alc.). The cathode and anode were separated by porous polyethylene impregnated with Ca(OH)<sub>2</sub> (making contact with the cathode) and with cellophane (2 sheets in contact with the anode). The upper portion of the

**battery** was equipped with a neoprene rubber safety value and a gas catalyst consisting of graphite impregnated with 1% Pd [7440-05-3] and waterproofed with a copolymer of C2F4 and hexafluoropropylene. The **battery** was then filled with the **electrolyte** and sealed. By placing the cathode in contact with the Ni container, the self-discharging tendency was reduced and cell life was extended. Pressure build up was small even with a 1-hr charging rate. In contrast, a **battery** not using the gas catalyst showed a large pressure buildup even on a 10-hr charging. By using an **electrolyte** concentration of 4-6M the discharge and lifetime characteristics were optimized.

ST nickel zinc storage **battery**; palladium catalyst sealed **battery**

IT Catalysts and Catalysis  
(graphite-palladium, for nickel zinc secondary **batteries**, gas accumulation prevention by)

IT Batteries, secondary  
(nickel-zinc sealed, catalyst for)

IT 1305-62-0 1314-13-2, uses and miscellaneous

RL: USES (Uses)  
(anodes containing, zinc, in sealed **batteries** with palladium catalyst)

IT 7440-66-6, uses and miscellaneous

RL: USES (Uses)  
(anodes, containing calcium hydroxide and zinc oxide, in sealed **batteries** with palladium catalyst)

IT 7440-05-3, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)  
(catalysts, for gas buildup prevention, in nickel-zinc secondary **battery**)

IT 7440-02-0, uses and miscellaneous

RL: USES (Uses)  
(cathodes, in sealed secondary **batteries** with zinc anode and palladium catalyst for pressure buildup prevention)

L52 ANSWER 32 OF 38 JAPIO (C) 2006 JPO on STN

AN 2005-116493 JAPIO

TI CHARGING METHOD OF LEAD STORAGE BATTERY

IN KOZAWA AKIYA; KUREO MANOIN; WADA MAMORU; MASE SHUNZO

PA MASE SHUNZO

KOZAWA AKIYA

PI JP 2005116493 A 20050428 Heisei

AI JP 2003-383150 (JP2003383150 Heisei) 20031008

PRAI JP 2003-383150 20031008

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2005

IC ICM H01M010-44

ICS H01M010-08

AB PROBLEM TO BE SOLVED: To recover a lead storage **battery** whose **battery** property is deteriorated in a short time and to maintain the property for a long time.

SOLUTION: A pulse current is applied to the lead storage **battery** containing at least one of a group comprising polyacrylic acid, polyacrylic ester, polyvinyl alcohol, and particulate lignin in an **electrolyte** to charge it.

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L52 ANSWER 33 OF 38 JAPIO (C) 2006 JPO on STN

AN 2004-356076 JAPIO

TI REGENERATING METHOD FOR LEAD-ACID BATTERY

IN KOZAWA AKIYA; SUZUKI YOSHITAKA

PA MASE SHUNZO

KOZAWA AKIYA

PI JP 2004356076 A 20041216 Heisei  
 AI JP 2003-185790 (JP2003185790 Heisei) 20030526  
 PRAI JP 2003-185790 20030526  
 SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2004  
 IC ICM H01M010-42  
 ICS H01M010-08  
 AB PROBLEM TO BE SOLVED: To regenerate a degraded lead storage battery.

SOLUTION: A heavy current is applied into the **electrolyte** of a lead storage **battery** for a long time, by adding at least one organic addition agent from a group composed of a **polyvinyl** alcohol, a polyacrylic acid, and **lignin**. Consequently, the crystals of lead sulfate of a cathode are fine grained, and then the specific gravity of the **electrolyte** is raised by charging.

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L52 ANSWER 34 OF 38 JAPIO (C) 2006 JPO on STN  
 AN 2004-356044 JAPIO  
 TI MANUFACTURING METHOD OF ION CONDUCTOR, AND MANUFACTURING METHOD OF SECONDARY BATTERY  
 IN AKASAKA AKIFUMI; YAMAMOTO TOMOYA  
 PA CANON INC  
 PI JP 2004356044 A 20041216 Heisei  
 AI JP 2003-155136 (JP2003155136 Heisei) 20030530  
 PRAI JP 2003-155136 20030530  
 SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2004  
 IC ICM H01B013-00  
 ICS C08F002-00; C08F002-44; C08F290-06; H01M010-40  
 ICA H01B001-06  
 AB PROBLEM TO BE SOLVED: To provide a manufacturing method of an ion conductor which can be manufactured by a simple method at low cost having a high ion conductivity and an excellent mechanical strength by further enhancing **aligning** property of a **polymer** skeleton of the ion conductor, and to provide a manufacturing method of a secondary **battery** having excellent cycle life performance.

SOLUTION: The manufacturing method of the ion conductor mainly composed of at least one kind of **polymer** compound and **electrolyte**, having anisotropic characteristics in ion conductivity, has a **polymerization** step of forming the ion conductor by a **polymerization** reaction of a **polymer** precursor including at least one kind of a monomer and the **electrolyte**. In the **polymerization** step, during the **polymerization** reaction, the precursor of the **polymer** is kept at a temperature not higher than a temperature in which the monomer in the precursor shows the **aligning** property.

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L52 ANSWER 35 OF 38 JAPIO (C) 2006 JPO on STN  
 AN 2003-331908 JAPIO  
 TI ADDITIVE FOR LEAD-ACID STORAGE BATTERY  
 IN HARADA HIROBUMI; YOKOI YOSHIYORI; KOZAWA AKIYA  
 PA TAKEHARA:KK  
 YOKOI KAIHATSU KK  
 KOZAWA AKIYA  
 PI JP 2003331908 A 20031121 Heisei  
 AI JP 2002-141177 (JP2002141177 Heisei) 20020516  
 PRAI JP 2002-141177 20020516  
 SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2003  
 IC ICM H01M010-08

AB PROBLEM TO BE SOLVED: To provide an additive for a lead-acid storage battery which can re-activate the battery quicker than conventional additive, effective for long period.

SOLUTION: Organic polymer and particulate lignin with diameter of 0.01-0.8  $\mu$ m are added as the additive to the lead-acid storage battery. Differing from the soluble lignin, the particulate lignin is insoluble to electrolytic solution of the lead-acid storage battery and maintains suspended state in the solution. Because of this, the particulate lignin is stable against the electrolytic solution, hardly decomposed, and effective for a long period. Furthermore, generation of hydrogen at charging can be effectively prevented, and charging efficiency of a negative electrode can be improved by adding particulate coprecipitating mixture of lead sulfate or barium sulfate.

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L52 ANSWER 36 OF 38 JAPIO (C) 2006 JPO on STN

AN 2003-151618 JAPIO

TI LEAD-ACID BATTERY AND ADDITIVE FOR LEAD-ACID BATTERY

IN IKEDA SHOICHIRO; KOZAWA AKIYA; YOSHIO MASAYUKI

PA TAGAWA KAZUO

KOZAWA AKIYA

PI JP 2003151618 A 20030523 Heisei

AI JP 2001-382340 (JP2001382340 Heisei) 20011109

PRAI JP 2001-382340 20011109

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2003

IC ICM H01M010-08

ICS H01M004-62

AB PROBLEM TO BE SOLVED: To prevent drop in capacity in charging and discharging of a lead-acid battery, decrease internal resistance, and increase the capacity of the battery.

SOLUTION: This lead-acid battery contains indium in an electrolyte and/or an electrode active material mold. An additive for the lead-acid battery contains indium. The additive for the lead-acid battery contains indium and at least one selected from a group comprising polyvinyl alcohol, polyethylene glycol, polyacrylic acid, and lignin.

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L52 ANSWER 37 OF 38 JAPIO (C) 2006 JPO on STN

AN 2001-313064 JAPIO

TI LEAD STORAGE BATTERY AND ITS ADDITIVE AGENT

IN IKEDA SHOICHIRO; YAMASHITA MASAMICHI; KOZAWA AKIYA

PA MASE SHUNZO

TAGAWA KAZUO

KOZAWA AKIYA

PI JP 2001313064 A 20011109 Heisei

AI JP 2000-169775 (JP2000169775 Heisei) 20000428

PRAI JP 2000-169775 20000428

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

IC ICM H01M010-08

ICS H01M004-14; H01M004-62

AB PROBLEM TO BE SOLVED: To prevent a degradation of a capacity accompanying a charge/ discharge electricity of a lead storage battery, to reduce an internal resistance, and to increase capacity of a battery.

SOLUTION: The lead storage battery includes polyacrylic acid or its ester, and polyvinyl alcohol in an electrolyte and/or a negative electrode active- material molding body. Moreover, an additive agent for the lead storage battery contains at least 1

kind in a group consisting of stannous sulfate, stannic sulfate, and colloid-like lead sulfate, and at least 1 kind in a groups consisting of polyacrylic acid, polyacrylic acid ester, and polyvinyl alcohol soluble lignin.

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L52 ANSWER 38 OF 38 JAPIO (C) 2006 JPO on STN  
AN 2001-028263 JAPIO  
TI LEAD-ACID BATTERY FORMATION METHOD  
IN OMAE TAKAO; ISHIMOTO SHINJI  
PA JAPAN STORAGE BATTERY CO LTD  
PI JP 2001028263 A 20010130 Heisei  
AI JP 1999-199904 (JP11199904 Heisei) 19990714  
PRAI JP 1999-199904 19990714  
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001  
IC ICM H01M004-22  
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AB PROBLEM TO BE SOLVED: To efficiently conduct formation, even at high specific gravity formation with low efficiency and increase low rate discharge capacity and high rate discharge capacity by keeping electrolyte temperature during current supply in a specified range, and increasing the quantity of supply electricity for formation to specified times the theoretical capacity of a positive electrode active material.

SOLUTION: Electrolyte temperature during current supply is kept at 50-70°C, and the quantity of supply electricity is made 150-250% that of the theoretical capacity of a positive electrode active material in the formation of a lead-acid battery. The total current supply time for formation, or the time kept at high temperature is preferably at most 10 hours, and thereby, even in the lead-acid battery in which the weight ratio of a negative electrode active material to the positive electrode active material is 0.5 or more but less than 1.0, battery formation can surely be conducted. When an organic additives, for example, a natural polymer such as lignin or its derivative, or a synthetic organic material is contained in a negative electrode plate, the decomposition of these materials is retarded, the drop in discharge performance of the negative electrode is prevented, and a lead-acid battery with good high rate discharge performance can be manufactured.

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